UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Silver Spring, Maryland 20910

SEP 5 1995

MEMORANDUM FOR: Distribution

FROM: George H. Darcy
Chief, Plans and Regulations Division

SUBJECT: Amendment 38 to the Fishery Management Plan (FMP) for the Groundfish Fishery of the Bering Sea and Aleutian Islands Area and Amendment 40 to the FMP for Groundfish of the Gulf of Alaska

Attached are the subject amendments and associated documents prepared by the North Pacific Fishery Management Council for formal review under the Magnuson Fishery Conservation and Management Act. These amendments would extend through December 31, 1998, the authority to allocate pollock and Pacific cod for processing by the inshore and offshore components of the industry and continue the Western Alaska Community Development Quota program.

Please provide your comments (including "no comment") by October 6, 1995. If you have any questions, please call Bill Bellows at 301-713-2341.

Attachments

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DRAFT FOR SECRETARIAL REVIEW

ENVIRONMENTAL ASSESSMENT / REGULATORY IMPACT REVIEW / INITIAL REGULATORY FLEXIBILITY ANALYSIS

(EA/RIR/IRFA)

for the proposed reauthorization of

AMENDMENTS 38/40

to the

GULF OF ALASKA AND BERING SEA/ALEUTIAN ISLANDS

FISHERY MANAGEMENT PLANS

(INSHORE-OFFSHORE PROCESSING ALLOCATIONS AND POLLOCK CDQ PROGRAM)

Prepared by staff of the
North Pacific Fishery Management Council

with contributions from NMFS and State of Alaska DCRA

August 1, 1995

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EXECUTIVE SUMMARY

Background and Need for Current Action

This document examines a potential reauthorization of Amendment 18/23 to the BSAI and GOA FMPs, which established the inshore-offshore processing allocations for pollock and Pacific cod and the pollock CDQ program for Western Alaska. These amendments are currently scheduled to expire at the end of 1995. The Council originally approved Amendment 18/23 in 1991 after a series of analyses of the economic and distributional impacts, though the BSAI pollock allocation was disapproved by the Secretary of Commerce (SOC) in 1992. After further analyses, the Council submitted a revised Amendment 18 which proposed allocation percentages different than the original submittal. This was approved by the SOC after additional revisions were made to the allocation percentages by the SOC. The final Amendment 18/23 contained the following primary elements:

1. For the GOA, 100% of pollock would be reserved for vessels delivering to inshore plants, and 90% of Pacific cod would be reserved for vessels delivering to inshore plants.

2. For the BSAI, 35% of the pollock is reserved for inshore for all three years.

3. A catcher vessel operational area (CVOA) reserved for catcher vessels in the BSAI pollock B season.

4. A 7.5% allocation of the BSAI pollock quota for Western Alaska community development (CDQs).

5. A specific list of alternatives for "comprehensive rationalization" of the fisheries; within that list were traditional management tools, limited entry programs including IFQ allocations, and continuation of the inshore-offshore allocation. This was tied to the December 31, 1995 sunset date with the stipulation that the inshore-offshore allocation would expire at that time if the SOC had not approved a more comprehensive management program for these fisheries.

At about the same time, the Council embarked on an initiative to develop more comprehensive, long-term management programs to address the overcapitalization and allocations problems facing the industry, not only with regard to inshore-offshore, but to the overall groundfish and crab fisheries off Alaska. This Comprehensive Rationalization Plan (CRP) examined a myriad of alternative approaches, but focused on some type of limited entry or IFQ program. The current focus is on a vessel license program which was approved by the Council in June 1995. The Council indicated then that its next major step would be consideration of an individual quota system for BSAI pollock.

A comprehensive management regime, will likely take two to three more years to implement. In order to maintain stability between industry sectors and to facilitate further development of more comprehensive management regimes, the Council is considering an extension of Amendment 18/23 for an additional three years. This would also allow for realization of the goals and objectives of the pollock CDQ program. The alternatives currently being considered are:

Alternative 1: No Action - the current inshore-offshore allocation and the pollock CDQ program would expire at the end of 1995.

Alternative 2: Continuation of the current program, as is, for a period of three additional years. This would include the pollock CDQ program as an unseverable element of the overall package.

The Council has also indicated a desire to reexamine specific provisions of the Catcher Vessel Operational Area (CVOA) and the definition of inshore and offshore relative to freezer longliners.

Organization of this Document

Chapter 1 of the document provides details on the background and development of Amendment 18/23, and the process leading to the current consideration of reauthorization. Chapter 2 contains a review of the previous analyses conducted relative to Amendment 18/23, with the primary results of those analyses, and then describes the methodological approach used for the current analysis.

Chapters 3 and 4 are devoted to a description of what has actually occurred during the past three years with the inshore-offshore allocation in place. This includes details on harvests of pollock and Pacific cod, processing activities, and activities within the CVOA. Chapter 5 provides projections of what would occur without the reauthorization of Amendment 18/23, while Chapter 6 provides projections with reauthorization of that amendment. Chapter 7 then makes comparisons of these projected outcomes to what was occurring in the base case described in the previous chapters. Overall findings and conclusions regarding the basic allocation are presented in Chapter 7. Community Impacts are discussed in Chapter 8, with an examination of the pollock CDQ program provided in Chapter 9. Chapter 10 details the preferred alternative chosen by the Council at its June 1995 meeting, and provides updated information regarding prices and products.

Findings from Previous Analyses

Original SEIS from March 1992

The original SEIS prepared by Council staff focused on input/output modeling which projected distributional changes in employment and income at the community/regional level. This analysis indicated that losses in employment and income for the Pacific Northwest induced by the inshore-offshore allocations analyzed would be more than offset by gains in direct income to Alaska regional economies. The magnitude of this effect depends on the specific allocation alternative chosen, but holds true across all alternatives to some degree. The Preferred Alternative of the Council was a three-year phase-in of allocation percentages (35/65, 40/60, and 45/55 inshore-offshore). Combining offshore and inshore regional impacts yielded a net gain in direct income of around $9 million in the first year of the program, based on the projections in that analysis.

Cost-Benefit Study from April 1992

As part of the Secretarial review process, NMFS economists conducted a cost-benefit oriented analysis which focused on overall net benefits (or losses) to the nation which would result from the inshore-offshore analysis. The basic methodology of that analysis was to measure producer surplus for each sector and then to predict the relative changes in that producer surplus for each sector—inshore and offshore. This involved estimation, for each sector, of relative harvest percentages, product mixes, recovery rates, and prices for fish. From this estimate, total revenues are projected, then subtracted from total estimated costs of production to arrive at net revenues (or producer surplus) for each sector, for both the "allocation case" and "no-allocation case." The net revenue difference between the two cases is the estimate of overall changes in net revenues to the nation of the allocation.

That analysis projected a net loss to the nation of $181 million over the three-year life of the allocation. Gains to the inshore sector were outweighed by losses to the offshore sector by that amount. Assumptions and parameters used in this analysis were the subject of intense disagreement and debate, and the analysis was largely silent on the issues of distributional and community impacts. The analysis was part of the basis of Secretarial review, and subsequent disapproval of the BSAI pollock allocation (the GOA allocations were approved as well as the CDQ program for the BSAI).

Supplemental Analysis from September 1992

Following Secretarial disapproval, a final Supplemental Analysis was jointly prepared by NMFS economists and Council staff. This analysis combined a cost-benefit assessment with an income/distributional analysis. The analysis also contained a detailed examination of the CVOA. Alternatives examined included the three-year phase-in as described above and a more straightforward 30/70 split over the entire three years. The Council finally approved, and forwarded to the Secretary, an allocation of 35/65, 37.5/62.5, 37.5/62.5. The final analysis projected the following major findings for the Preferred Alternative:

- Cost-benefit analyses projected an overall loss to the nation of $33.6 to $37.6 million over the three years of the allocation, depending on which set of parameters was used in the models. Sensitivity analysis indicated that, with certain parameters in the model, these projected losses could be reduced substantially, or could result in a net gain to the nation of $11 million. Essentially, the projections of net benefits/(losses) covered a range of possibility, from positive to negative depending on parameters and assumptions used, with the expected value in the negative.

- Distributional income analyses, using the same parameters assumed in the cost/benefit study, also projected an overall net loss, in terms of direct income at the U.S. level, with offshore losses outweighing gains to the inshore sectors. The estimated loss was $20 - 28 million over the three-year allocation (Preferred Alternative), though a potential overall gain of $11 million could be projected using model parameters based on public testimony to the Council.

- The Social Impact Assessment (SIA) which accompanied this analysis concluded that benefits to Alaskan coastal communities from the proposed allocation would be immediate and direct, while corresponding losses to Pacific Northwest communities would be less direct and less immediate. Overall, the study concluded that a given level of benefits accruing to Alaskan coastal communities was proportionally more significant when compared to regions like the Pacific Northwest where alternative industries and employment existed. The SIA noted that continuation of status quo (no inshore-offshore allocation) would have immediate and direct negative consequences for economic development and social stability in Alaskan coastal communities who rely heavily on fish harvesting and processing.

Current Analysis - Scope and Methods

The current analysis of the proposed reauthorization of Amendment 18/23 does not attempt to respade the previous cost-benefit or distributional analyses; rather, it examines the current state of the fisheries and identifies any significant changes which have occurred which would affect the overall findings of the previous analyses. Any directional changes, and their likely magnitudes, from the original analyses are identified in this iteration. Projections are made regarding the likely distributions of fishing and processing activities under both current alternatives—expiration of the allocation or reauthorization. Using the 1993 and 1994 fisheries as a base case for comparison, impacts of these projections are offered.

This analysis also examines additional issues which have been identified by the Council in the proposed reauthorization. In addition to potential preemption, these include stability within the industry, future trade-offs for affected industry sectors, and the potential impacts on the Council's overall CRP development. The pollock CDQ program is examined from the perspective of the current status of each of the six CDQ organizations' development, relative to the overall goals and objectives of the CDQ program created by the Council.

Base Case Description of the Fisheries, CPUE, Bycatch, and CVOA Activities

Chapter 3 contains data and discussion of the distribution (size and spatial) of walleye pollock in the eastern Bering Sea, the distribution (temporal and spatial) of the pollock fishery, and the impact that the Catcher Vessel Operation Area (CVOA) has had, and may continue to have, on the fishery and other members of the eastern Bering Sea ecosystem (marine mammals). Chapter 3 is divided into the following sections:

I. Eastern Bering Sea Pollock Natural History and Recent Stock Assessments

II. Pollock Populations and Fisheries (1990-94)
   A. Size and Biomass Distribution of Pollock from Surveys and Fisheries
   B. Bycatch of Prohibited Species (Surveys and Fishery) and Fishery Pollock CPUE within and outside the CVOA

III. Effects of CVOA on Marine Mammals
   A. Steller sea lion
   B. Pacific harbor seals
   C. Northern fur seal
   D. Killer whales
   E. Gray whales
   F. Pollock as prey, Fishery Exploitation Rates (1990-94) and Impacts of the CVOA

From 1990 to 1994, the exploitable (30+ cm in length) pollock population in the eastern Bering Sea changed from one composed of several strong year-classes (spawned in 1978, 1982 and 1984) to one dominated by a single year-class (1989). Furthermore, there has been a shift in exploitable pollock biomass (and the fishery) to the southeast (toward the CVOA), due to the distribution of the 1989 year-class. While surveys in the last 5 years continue to show that commercial-sized pollock are widely distributed throughout the southeastern Bering Sea, both inside and outside of the CVOA, the distribution of exploitable pollock during the summer can change from year to year, which may cause the distribution of the fishery and areal CPUEs to change.

The fishery harvests pollock disproportionately to its areal biomass distribution. During the 1990-94 B-seasons, harvest rates of exploitable pollock in the CVOA ranged from 22% to 50%, rates which were much higher than in Areas 51 and 52 outside of the CVOA (combined range of 1-14%). Furthermore, A-season pollock removals have also been concentrated in the CVOA.

Survey and fishery data have shown that bycatch rates of :

- herring and salmon have been higher inside the CVOA than outside, particularly from July-September;
- herring have been higher outside the CVOA from October-December;
- halibut by bottom trawls have been higher inside the CVOA than outside;
- red king crab have been higher outside the CVOA; and
- bairdi Tanner crab have been either higher or lower inside the CVOA than outside, depending on the fishery data set being analyzed.

Recent information on distribution of the crab species suggests that red king crab bycatch rates should be lower, and Tanner crab bycatch rates should be higher inside the CVOA than outside in areas frequented by the pollock fishery.

Pollock are an important prey for marine mammals and birds in the eastern Bering Sea. While most pollock are eaten as juveniles, there is considerable overlap in the size distributions of pollock taken by the fishery and those eaten by Steller sea lions. The spatial and temporal concentration of the pollock fishery is contrary to the management philosophy utilized for the pollock fishery in the Gulf of Alaska to minimize the likelihood of creation of localized depletions of marine mammal (particularly Steller sea lion) prey. Due to the distribution of the dominant 1989 year-class and the apparent desire of the fleet to avoid smaller members of the cohort, effort shifted from areas west of 170° W to the southeast (including a foraging area designated as Steller sea lion critical habitat under the ESA) in 1993-94. However, if the CVOA had not excluded the offshore fleet during these 'B' seasons, it is likely that harvest rates and removals from the CVOA and critical habitat would have been greater than they were.

Base Case Assessment of Economic Indices

Chapter 4 describes the status of the fisheries under the inshore-offshore allocations from 1992-1994, with a focus on economic indices related harvesting and processing of GOA pollock and P. cod and BSAI pollock. A description of fish prices used in the analysis, and status and trends of these prices is provided. Prices for major pollock products, other than roe, declined significantly from 1991 and 1992 levels to 1994 levels for both sectors. A description of major pollock and P. cod processors, by various classes, is also provided in Chapter 4. In order to describe actual activities which occurred over the last three years, a detailed examination of the GOA P. cod, GOA pollock, and BSAI pollock fisheries is provided. The results of this examination are then compared to results as projected in the original analyses of inshore/offshore. Major findings from this examination are summarized below:

GOA Pacific Cod Fisheries

- Despite the 10% allocation of Pacific cod, the offshore sector took only 3% of the TAC in 1993 and 1994.
- About 10% of the overall GOA quota in 1993 and 1994 was taken by longline catcher/processors designated to the inshore category.
- Production for the inshore sector has shifted to higher priced fillets, while falling prices overall and reduced harvest levels have kept revenues per ton constrained.
- Revenues per ton decreased relatively more for the offshore sector, though some of this may be attributable to mandatory discarding under the rules of the allocations.

GOA Pollock Fisheries

- Total offshore sector harvest of pollock was about 1% in 1993 and 1994; the processing locations for GOA pollock have shifted significantly to Kodiak and Sand Point/King Cove locations (from Dutch Harbor) from a combined 65% in 1991 to 85% in 1994.
- Processed product form has shifted substantially over the period 1991-1994; more emphasis was placed on surimi in 1992, then shifted back to fillets and roe by 1994. Roe prices have risen and remained at high levels through 1994, while both fillet and surimi prices have dropped dramatically, with a relatively higher price decrease in surimi.
- Total product utilization by the inshore sector is higher than offshore sector utilization (21-22% of total weight for the inshore sector, over all years vs. 16% for the offshore sector in 1991).
- By 1994, roe comprises nearly 18% of total gross revenues for the inshore sector, with fillets accounting for 49% and surimi for just over 29%.

- Gross revenue per mt has fallen from 1991 to 1994 for the inshore sector, but not by much considering product price reductions. Changes in product mix combined with differential prices for each product have contributed to relative 'maintenance' of revenues per ton.

- Lower revenues per ton in the offshore sector (based only on 1991 data) may indicate that total revenues generated from the pollock fisheries would have been lower without the implementation of the Amendment.

BSAI Pollock Fisheries

- Price trends were similar to GOA with surimi and fillets decreasing significantly and roe maintaining high levels. Both sectors have increased surimi production relative to other product forms, while fillet and roe production as a percentage of overall production has remained fairly constant, with the exception of roe production for the offshore sector which has dropped as a percentage of overall production.

- Lower prices have decreased gross revenues for both sectors; gross revenues per mt of catch have also dropped for both sectors, though differentially. The inshore sector revenue per mt decreased 11.3% from 1991 to 1994 while the offshore sector revenue per mt decreased 32.6% over the same period.

- Compared to the projected impacts of inshore-offshore as modeled in the original analyses, these changes indicate that projected impacts (net losses to the nation) were likely overstated, and that actual net losses are likely much less. The current analysis indicates that the range of expected economic impacts of the allocation would be shifted more toward a neutral point.

The conclusions noted above must be tempered by the limitations of the information available to the analysis. The most notable caveat is the lack of new information regarding costs of harvest and production for both sectors. The best cost information available was that used in the original study which was based on an "OMB Survey" conducted in the fall of 1990. Efforts to update cost information since that time have not been successful. Therefore, the analysis assumes that costs per ton of harvest and production remained constant for all producers in both sectors, and attempts to work around this shortcoming by focusing on utilization rates, changes in product mix, and apparent changes in weekly catch and production. Additionally, information regarding product prices for 1994 has not yet been compiled, and therefore, 1993 prices were applied to 1994 production totals.

Projections with Expiration of Amendment 18/23

Chapter 5 projects probable implications of Alternative 1, the Expiration of the Inshore-Offshore Amendments. The chapter focuses on projection of the harvest splits and potential economic impacts which might occur in the BSAI pollock fishery without the inshore-offshore allocation. It goes on to a more qualitative discussion of possible outcomes in the GOA pollock and Pacific cod fisheries.

BSAI Pollock Fishery Under Alternative 1

Seasonal averages and maximum catches were used to estimate harvest splits under Alternative 1. These two different methodologies projected inshore harvests of 29.15% and 25.46%, respectively. It appeared that using the seasonal averages predicted the 1991 harvest split more accurately than did the seasonal maximums. Using the projected harvest splits along with total product to total catch ratios (the "Utilization Rate"), product mixes and prices assumed for the 1994 fisheries, we estimated gross revenues. The results showed a probable decline in overall gross revenues accruing to the BSAI pollock fisheries under Alternative 1 from $515 million estimated for the 1994 fishery to $511 million using the seasonal averages or $509 million using the season maximums, a very small change relative to the overall magnitude of the fishery. Further, the projected harvest splits using the seasonal average approach indicated that the overall shift in harvest to the inshore sector from the offshore sector, which was predicted to occur under the inshore-offshore allocation in the Supplemental Analysis, were likely overstated. This implies that the estimated net losses to the Nation, resulting from Amendment 18 in the Supplemental Analysis, were also overstated.

The analysis also concluded that Alternative 1 would likely have negative impacts on the stability of coastal communities, and upon the industry itself, particularly during the crucial period in which the Council attempts to rationalize the fisheries with comprehensive solutions.

Overall, it was concluded that Alternative 1 is less likely to provide significant gains in net benefits to the Nation than might have been supposed in the Supplemental Analysis. It is also likely that, given the inherent uncertainty of the information and the models used, the cost/benefit implications of the inshore-offshore allocation approach neutrality, and therefore the cost/benefit implications of the lack of an allocation also approach neutrality. These conclusions are based on several key assumptions:

(1) Discard and utilization rates remain at the same relative levels during 1996-1998 as in 1994.
(2) 1993 prices used to estimate 1994 gross revenue will be applicable for the years 1996-1998.
(3) Product mix in each of the years from 1996-1998 will be identical to those found in 1994.
(4) Relative weekly catch and production between sectors will remain as it was in 1994.
(5) Relative harvests and product costs between sectors remain the same as in the supplemental analysis.
(6) Biomass levels, TACs, and therefore CPUEs, remain at 1994 levels.

These are fairly strong assumptions and thus give rise to the fairly weak conclusion of the neutral impact on the cost/benefit implications of the allocation. Given a neutral allocation, in terms of efficiency, conclusions regarding stability and impacts on communities become all the more relevant.

GOA Pollock Fishery Under Alternative 1

Estimates of impacts of Alternative 1 on the GOA pollock fishery were qualitative. In general, it was concluded that under the Alternative offshore catcher-processors would likely enter the GOA pollock fisheries in the second and third quarter apportions, causing shorter seasons and destabilizing the current participants, noting that these conclusions are based on assumptions similar to those listed above.

GOA Pacific Cod Fishery Under Alternative 1

Estimates of impacts of Alternative 1 on the GOA Pacific cod fishery were also somewhat qualitative. In general it was concluded that freezer longliners would benefit significantly under the Alternative. It appears that they would be able to enter the GOA Pacific cod fishery until the TAC was reached, and then continue on into the BSAI to fish under the guaranteed fixed gear TAC. It is also possible that some offshore catcher-processors would participate in the GOA Pacific cod fisheries. Both of these conclusions would lead to shorter seasons and would likely be destabilizing for the current participants.

Projections with Reauthorization of Amendment 18/23

Chapter 6 contains the projections of impacts of Alternative 2 - reauthorization of Amendment 18/23 for an additional three years. Projections of harvest/processing activity are straightforward for this alterative - it would be 35/65 for the BSAI pollock, GOA pollock would be 100% inshore, and GOA P. cod would be 90% inshore. Patterns of harvesting and processing are expected to be relatively unchanged from the base case; i.e., the 1993 and 1994 fisheries. GOA pollock stocks are relatively small, decreasing, and quarterly allocated. Alternative 2 would facilitate inseason management of the pollock stocks and avoid quota overruns by limiting the harvest of pollock to smaller, lower capacity shore based trawlers. If the Council chooses Alternative 2, other considerations include the CVOA and the definition of 'inshore' relative to freezer/longliners. Major findings from the analysis are presented below:

<u>CVOA Considerations</u>

- Shore based vessels are more dependent on the CVOA (and any nearer shore fisheries) than the offshore sector.

- Pollock are harvested disproportional to their areal distribution; harvest rates of pollock are concentrated in the CVOA in the 'A' season, and harvest rates are much higher inside the CVOA than outside in the 'B' season.

- Allowing offshore sector vessels inside the CVOA in the 'B' season will likely exacerbate the disproportionate harvest rates relative to pollock distribution.

- Variation from year to year is exhibited relative to average size of pollock inside and outside the CVOA, with average size rates being similar; percentage of fish > 30 cm (commercially viable size) is higher inside the CVOA than outside.

- Overall, CPUEs of exploitable fish have been similar overall both inside and outside the CVOA, so exclusion from the CVOA should pose no significant impediments to offshore sector fishing operations. Operating costs, however, could be higher outside the CVOA.

- Increased harvest rates in the CVOA could adversely affect marine mammal critical habitat areas in the CVOA if the restrictions are relaxed.

- Bycatch rates of salmon and herring are higher inside the CVOA during the 'B' season time period. Additional effort could result in higher overall bycatch of these species.

<u>Cost-Benefit Implications</u>

A reauthorization of Amendment 18/23 would be expected to result in the same general cost-benefit impacts as projected in the original Supplementary Analysis from 1992, as adjusted by findings from this current analysis. A substantive, comprehensive, quantitative reassessment has not been conducted in this analysis primarily because of the lack of new cost information which is a key element of a cost/benefit analysis, but changes in other primary model parameters have been identified which may directionally affect the original findings. In Chapter 4, it was concluded that the expected net losses to the nation were likely overstated in the original analysis, and that changes in the actual fisheries relative to assumptions used in that analysis would tend to move the expected impacts more towards neutral, given the data available to the analysis and the assumptions used.

<u>Distributional Impacts</u>

The methodologies for projecting distributional changes in employment and income, at a community/regional level, are directly dependent on the revenues generated from the fisheries for each sector. The original analysis (Supplemental analysis from September 1992) predicted net losses in direct income of $20-28 million, depending on model parameters used, and could project a gain of $11 million using selected model parameters. In that analysis benefits to inshore sectors were more than outweighed by losses to the offshore sector. Based on information presented in Chapter 4, fish prices and product mixes have changed to the point that overall revenues from the fisheries for both sectors are significantly reduced, relative to the projections made in the original analysis. The bottom line effect of this is to dampen the magnitude of any distributional effects overall; i.e., drive them towards the zero, or neutral point, keeping in mind that distributional effects are a function of both income from fisheries and employment from fisheries. Previous projections indicated a substantial loss of employment for the Pacific Northwest communities, and a gain for Alaska based communities. There is no information contained in this analysis to indicate that those employment projections were inaccurate.

The reductions in direct income from the fisheries for both sectors tend to reduce the aggregate income effects when compared to the original analyses, though we still expect gains to the inshore sector and losses to the offshore sector overall, when combined with employment effects. It is important to reiterate, however, that even though the trend is more towards a more neutral impact in aggregate, some distributional impacts will certainly still be expected, and any level of impacts to Alaska coastal economies is far more significant than a similar level of impacts to Pacific Northwest economies. This is a consistent finding in both the distributional analyses previously conducted and the Social Impact Assessment previously conducted. Therefore, although net negative impacts in direct income may still be expected, these impacts are reduced from projections in the original analysis. These impacts for 1996-1998, under the three-year extension, would be similar to the impacts actually occurring in 1993-1995.

Stability Implications

Compared to the base case (the 1993 and 1994 fisheries), continuation of the inshore-offshore allocations as they now exist would result in the least change, relative to that base case. Stability is epitomized by lack of change in a given industry or between sectors in a given industry. The existing allocations provide a reasonable assurance to each industry sector involved regarding the amount of fish for harvesting and processing. Business planning is largely affected by these allocations for both inshore and offshore processors and harvesting vessels which deliver to them. The continuation of these allocations for an additional three years would maintain the relationships between these sectors as they have developed over the past three years. The stability which has been established between these various industry sectors may not guarantee survival of entities within these sectors, but may be crucial to the successful fruition of the CRP program over the next three years. A stable environment in the fisheries has been cited by the Council as critical to successful CRP development. Indeed, the disruption of existing distributions of harvesting and processing of pollock and P. cod, and the business relationships based on those distributions, could have serious and adverse implications for successful CRP development.

Allowing the inshore-offshore allocations to expire would result in a projected "reallocation" of about 6% of the overall pollock quota in the BSAI; i.e., the split between inshore and offshore processing is estimated to be about 29/71, closer to pre-inshore-offshore splits (26.5/73.5), as opposed to the current 35/65. Because of this projected change, the reauthorization of Amendment 18/23 holds implications for future tradeoffs between industry sectors. Under the reauthorization, the offshore sector would be giving up about 6% of pollock harvests/processing which it would enjoy if the allocations were allowed to expire. Conversely, the inshore sector enjoys about a 6% "gain" under the reauthorization relative to expiration of the allocations. From the offshore sector's perspective, this 6% relative loss represents a tradeoff between increased revenues and some amount of upheaval in the industry which may result if the allocations are allowed to expire. Continuation of the allocations may provide the stable operating environment necessary for eventual implementation of CRP programs such as IFQs, something the offshore sector generally has been striving towards.

Inshore v. Offshore Definition of Freezer/Longliners

In the original Amendment 18/23, the designation of freezer/longliners as inshore or offshore was discussed, particularly relative to the allocation of Pacific cod in the GOA. Initially the Council had designated all freezer/longliners as "inshore." In the final decision, the Council altered this definition such that all catcher/processors (both trawl and longline) would be designated as either onshore or offshore depending on vessel size and average production. If a vessel was less than 125' in length, and processed less than 18 mt per day, round weight equivalent, it would be classified as "inshore." The rationale for this change was that the impacts on preemption issues were based more on overall vessel capacity as opposed to gear type, and further that the smaller catcher/processors which would be fishing against the inshore quota do contribute to shore based economies, even though they may not deliver catch to onshore processing plants. Based on the information available at that time, it was estimated that two trawl and ten fixed gear catcher/processors would receive the inshore designation. Based on harvest shares by sector at that time, it was estimated that this designation would, in effect, reclassify 5% of the GOA Pacific cod from offshore to inshore.

It has been suggested that all freezer/longliners should be allowed to fish against the inshore quota in the GOA. The analysis provides the following major findings relevant to this issue:

- 10% of the P. cod quota in 1993 and 1994 was taken by catcher/processors designated as 'inshore'; nearly all of this was by freezer/longliners.

- Of the total quota taken by hook and line gear, 58% is by freezer/longliners designated as inshore catcher/processors.

- Based on examination of catch rates by freezer/longliners currently excluded from the inshore GOA P. cod quota, allowing these vessels to fish on that quota could reduce the GOA season by as much as 40% based on current quotas. About 40% less of the overall quota would find its way to onshore plants.

- The group of vessels which would likely enter the GOA P. cod fisheries could end up taking 40% of the total GOA quota, and up to 90% of the total taken by all hook and line vessels.

- Given increased quotas in the GOA for 1995, the season length would remain nearly as long and deliveries to onshore plants would only be minimally reduced. Conversely, seasons could lengthen considerably if these vessels continue to be excluded.

Community Impacts

Although the distributional, income based analyses previously conducted (and described above) are based on economic activity at the community/regional level, an additional, more qualitative examination of community impacts is provided in this analysis. A review of the previous SIA from 1992, which focused on the communities of St. Paul, Dutch Harbor, Sand Point/King Cove, Kodiak, Newport, and Bellingham/Seattle, indicates that the smaller Alaska communities, which are fundamentally dependent on the groundfish fisheries, exhibit the most variability and vulnerability to socially disruptive forces. Inshore allocations were determined to provide the greatest benefit to Alaskan coastal communities and afford them the greatest opportunities for development and growth, while the only community negatively affected would be Ballard/Seattle. The absence of an allocation would very likely impact coastal Alaskan communities negatively, both economically and socially.

Immediate and direct positive impacts would be expected by Alaskan communities with the allocation, partially offset by negative impacts to Pacific Northwest employment and income, though the latter would be more easily absorbed by the more diverse economies of that region. Since 1992, additional infrastructures have developed in Alaskan coastal communities, partially in response to the guaranteed allocations from Amendment 18/23. Given the current status of the fisheries, and these communities which rely on fishing and processing, allowing the inshore-offshore allocations to expire, in the absence of alternative management remedies, would likely result in at least the same level of impacts as previously projected. Impacts at this time could be exacerbated beyond those previously predicted due to the additional infrastructures and the ability of these communities to utilize the current allocations.

Pollock CDQ Program

Chapter Nine of this analysis provides a separate examination of the pollock CDQ program. This examination relies partially on a report from the State of Alaska Department of Community and Regional Affairs which examines the relative attainment of overall goals and objectives of each of the six CDQ organizations receiving pollock allocations. While many of the individual projects have been completed or are in significant stages of development (61% of initial, critical projects are complete), many of the individual projects will not be completed if the program is allowed to expire at the end of 1995. Overall objectives of bringing these communities into fisheries self-sufficiency will be seriously jeopardized, and investments to date will be nullified, resulting in economic losses attributable to the current program.

Two fundamental questions formed the premise of the examination: (1) whether the development projects and initiatives underway now can be brought to fruition without a continuation of the allocation, and (2) once these development projects are completed, can they be sustained in the absence of a direct allocation of pollock? The answer to the first question seems apparent from the information at hand - the individual projects, as well as the overall development objectives of the program, will not be realized if the program sunsets in 1995. It does not appear to be a valid expectation that the program could transform the region in the short two and one-half years of existence.

The second question is more difficult to answer at this time. The future viability of the program in the absence of a direct allocation (even if infrastructures are fully developed) remains a critical question. Future development projects of the CDQ groups may hinge on the intent of the Council with regard to this question. Planning and development by these groups may be quite different without the expectation of a direct allocation in the future than they would be if a direct allocation is expected, either through the current mechanism or through some type of inclusion in the overall CRP process.

Preferred Alternative

Chapter 10 discusses the preferred alternative, and provides updated information on prices and products. The Council approved the reauthorization of the Inshore-Offshore Allocations of Pollock in the BSAI and of pollock and Pacific cod in the GOA. They also approved the continuation of the Pollock CDQ program for Western Alaska. If approved by the Secretary of Commerce, these amendments will be enacted as Amendment 40 to the GOA Groundfish FMP and Amendment 38 to the BSAI Groundfish FMP, and will be in effect for three years through 1998. Amendment 40 to the GOA FMP will allocate 100% of the pollock and 90% of the Pacific cod to the inshore sector. Under Amendment 38 in the BSAI, 7½% of the pollock TAC will be allocated to the Pollock CDQ Program, with the remaining pollock TAC divided between inshore and offshore harvesters; 35% to the inshore sector and 65% to the offshore sector. The CVOA is defined for the pollock "B-Season," within which only catcher vessels may operate. The Council also made some minor changes to the Catcher Vessel Operational Area (CVOA), and asked that any other regulations that deal with the inshore and offshore sectors also be reauthorized, including an extension of the delay of the start of the "A" Season for the offshore sector.

In reaching their decision to reauthorize inshore/offshore, the Council relied on the information contained in the original EA/RIR dated May 4, 1995, as well as information provided by the public in comments and testimony at the Council meeting. The Council also relied on a presentation from its Staff and from the SSC and the Advisory Panel. Staff indicated that updated information regarding 1994 product prices and 1993 production information had become available, and that a preliminary examination of that information did not result in any changes in the conclusion drawn in the EA/RIR. The Council concurred with those findings overall and concluded that reauthorizing the inshore/offshore allocations for an additional three-year period would promote stability in the industry, while allowing the Council adequate time to further develop its Comprehensive Rationalization Plan.

1 INTRODUCTION AND MANAGEMENT BACKGROUND

The inshore-offshore processing allocations implemented under Amendment 18 to the Bering Sea/Aleutian Islands (BSAI) Fishery Management Plan (FMP) and Amendment 23 to the Gulf of Alaska (GOA) FMP are scheduled to expire on December 31, 1995, along with the pollock Community Development Quota (CDQ) program implemented as part of Amendment 18/23. The North Pacific Fishery Management Council (Council) is interested in continuing the allocations implemented under the Amendments for an additional three-year period while they work toward development of more comprehensive management programs for these fisheries. The continuation, if approved, would include the 7.5% allocation of BSAI pollock to the CDQ program. The purpose of this document is to analyze the impacts of such a continuation, to specific industry sectors as well as the overall fisheries, within the overall development of the Council's Comprehensive Rationalization Program (CRP)[1].

The Council originally approved an inshore-offshore allocation in June of 1991 in response to growing preemption problems between U.S. industry sectors harvesting and processing groundfish in the EEZ off Alaska. Dominated by foreign fleets through the early 1980s, the domestic fisheries had expanded by the late 1980s, and by 1988 the fisheries were effectively domesticated. As one fishery after another became fully U.S. utilized, the Council was increasingly faced with highly controversial, allocative decisions concerning domestic users. In 1989, following a short season on BSAI pollock, several factory trawlers (catcher/processors) moved into the GOA, quickly taking a substantial portion of the pollock quota which a shore based catching and processing industry was planning to utilize later that year. This became the catalyst for the eventual Amendment 18/23.

Current and potential future preemption of resources by one industry sector over another became a focal issue for the Council, particularly with regard to pollock and Pacific cod in the GOA, and pollock in the BSAI. Though not necessarily a problem at that time in the BSAI, it was apparent that the capacity of the offshore catcher/processor fleet posed a real preemption threat to the inshore processing industry, which relied heavily on the pollock resource. Through a series of meetings in 1989 and 1990 the Council and industry developed analyses of various alternative solutions to the preemption problem. This was occurring at the same time as the Council was developing a moratorium on further entry into the fisheries off Alaska. The inshore-offshore allocation issue became an integral part of the overall effort towards addressing overcapitalization in the fisheries. The Council, in April of 1990, developed the following Problem Statement as the context for addressing the inshore-offshore processing allocations:

<u>Problem Statement</u>

> The finite availability of fishery resources, combined with current and projected levels of harvesting and processing capacity and the differing capabilities of the inshore and offshore components of the industry, has generated concern for the future ecological, social and economic health of the resource and the industry. These concerns include, but are not limited to, localized depletion of stocks or other behavioral impacts to stocks, shortened seasons, increased waste, harvests which exceed the TAC, and possible pre-emption of one industry component by another with the attendant social and economic disruption.
>
> Domestic harvesting and processing capacity currently exceeds available fish for all species in the Gulf of Alaska and most species in the Bering Sea. The seafood industry is composed of different geographic, social,

[1]In June 1995, the Council approved the reauthorization of Amendments 18 and 23 for the BSAI and GOA Groundfish FMPs. These changes will become Amendment 38 to the BSAI Groundfish FMP and Amendment 40 to the GOA Groundfish FMP. Chapters 2-6 of this document remain unchanged from that used by the Council in their decision process. Chapter 1 contains some changes documenting the Council's action. Section 7.7 in Chapter 7 includes some changes regarding the impacts on small communities (the Regulatory Flexibility Act). Finally, Chapter 10 has been added summarizing the Council's action in June of 1995. This chapter also includes a summary of information which became available prior to the Council action, but after the EA/RIR was made available in May 1995.

and economic components which have differing needs and capabilities, including but not limited to the inshore and offshore components of the industry.

> The Council defines the problem as a resource allocation problem where one industry sector faces the risk of preemption by another. The analysis will evaluate each of the alternatives as to their ability to solve the problem within the context of harvesting/processing capacity exceeding available resources.
>
> The Council will address these problems through the adoption of appropriate management measures to advance the conservation needs of the fishery resources in the North Pacific and to further the economic and social goals of the Act.

Prior to, and following, the drafting of the Problem Statement, the Council spent considerable time developing and refining alternatives, with the help of industry and a Fishery Planning Committee (FPC) appointed by the Council. This sequence of events is detailed in previous documents but is summarized here for reference.

By the end of 1989, the Council, with the help of the FPC, had established a list of alternatives to address the budding problem which included: traditional management tools, specific allocations of the quotas between industry sectors (with and without operational areas for each), quota allocations based on vessel size, and limited entry alternatives including an immediate moratorium. Also included were provisions for CDQ considerations within each of the primary alternatives. By late 1990, the Council had identified a direct quota allocation as the most viable alternative to the problem as identified in the Problem Statement shown above. Various potential percentage splits became the focus of further discussion and development, with the focus now centered on pollock and Pacific cod in the GOA and pollock in the BSAI.

The analysis of the various alternatives was completed in early 1991 and a decision was made by the Council in June 1991. The Council's Preferred Alternative consisted of the following major provisions:

1. For the GOA, 100% of pollock would be reserved for vessels delivering to inshore plants, and 90% of Pacific cod would be reserved for vessels delivering to inshore plants.

2. For the BSAI, a three year phase-in allocation for pollock only, with the percentage reserved inshore starting at 35%, then rising to 40% in the second year and 45% in the third year.

3. A catcher vessel operational area which would reserve a certain geographic area, for a specified time, for inshore harvesters.

4. A 7.5% allocation of the BSAI pollock quota for Western Alaska community development (CDQs).

5. A specific list of alternatives for "comprehensive rationalization" of the fisheries; within that list were traditional management tools, limited entry programs including IFQ allocations, and continuation of the inshore-offshore allocation. This was tied to the December 31, 1995, sunset date with the stipulation that the inshore-offshore allocation would expire at that time if the SOC had not approved a more comprehensive management program for these fisheries.

Following the Council's approval of this program, rulemaking was prepared for Secretarial review. At the same time, the SOC undertook a separate, in-house analysis to assess the potential economic impacts of the Council's recommendation. Based at least partly on that analysis the SOC approved all of the components of the Council's Preferred Alternative with the significant exception of Item 2 above - the pollock allocation for the BSAI, which was approved only for the 1992 'B' season. The disapproval letter cited unacceptable negative net economic benefits attributed to the allocation percentages under the three year phase-in recommended by the Council. This occurred in March of 1992.

In response to the partial disapproval, the Council undertook a Supplementary analysis of the issue which was released for public review on July 9, 1992. The Council met in August 1992 for a final decision on this issue. The percentages recommended by the Council were revised from the earlier recommendation and were as follows: For 1993, the split would be 35% inshore and 65% offshore, and for both 1994 and 1995 the split would be 37.5% inshore and 62.5% offshore. The final analysis was forwarded to the SOC on September 3, 1992. The SOC finally approved the Council's recommendations, but altered the percentages slightly so that the final allocations were 35% inshore and 65% offshore for all three years of the program. The full list of provisions of the final amendment are contained in Section 1.2.

A new, formal cost-benefit analysis has not been prepared for consideration of the continuation of Amendment 18/23. A summary of findings and projected impacts from previous analyses is relevant to any evaluation of continuation of that program, as it represents the best indicator of potential costs, benefits, and distributional impacts of the allocation. Section 1.3 summarizes the methodologies and results of those analyses for reference, as well as the Council's findings regarding trade-offs between net benefit projections and distributional impacts. Subsequent sections of the document will discuss projected impacts in the context of the present day fisheries and overall development of the Comprehensive Rationalization Program.

1.1 PURPOSE AND NEED FOR ACTION

The Council began serious development of Comprehensive Rationalization (CRP) in November 1992, shortly after resubmittal of Amendment 18 to the SOC, with establishment of the Comprehensive Planning Committee (CPC) and an initial meeting in Seattle to discuss the alternatives and develop a course of action. The Council initially concentrated its efforts on some type of comprehensive system of Individual Fishing Quotas (IFQs) for all groundfish and crab fisheries. The CPC was later disbanded as it became apparent that the issue required the full attention of the entire Council membership. As this program developed over 1993 and into 1994, it consumed a large part of the Council's meeting time and staff analytical time. It also became apparent that development of a comprehensive IFQ program was a very contentious issue for the industry and would not likely be resolved in the immediate future. There was also concurrent support building for some type of simpler, less contentious license limitation program, perhaps as a step in the overall development of CRP. By early 1994, the Council had directed its analytical resources specifically at a license limitation program for groundfish and crab fisheries off Alaska, while reserving further IFQ development until after development of the license program.

At that time, in early 1994, the Council also recognized that a license limitation program would not address the issue of inshore-offshore, and directed staff to begin an evaluation of continuing the program beyond the 1995 sunset date. Specifically, the Council is examining a proposed continuation of Amendment 18/23 (including the CDQ program for pollock) for an additional three years to allow for further development of the overall CRP initiative. In doing so, the Council is continuing the mandate established for itself back in 1992, when they recognized that a more permanent solution to overcapacity and preemption is needed. If Amendment 18/23 were allowed to lapse, the management void could indeed create the preemption problems envisioned when the Amendment was originally approved and implemented. In the current context of the issue, an additional and overriding concern of the Council is that of industry stability, both between and within sectors, which has been created during the three years of the program. This issue is of primary importance in this iteration of the inshore-offshore and will be of primary interest in the analyses of a continuation of that program. In December 1994, the Council developed the following Problem Statement relative to the inshore-offshore issue:

<u>DRAFT PROBLEM STATEMENT</u>

> The problem to be addressed is the need to maintain stability while the Comprehensive Rationalization Program (CRP) process goes forward. The Council believes that timely development and consideration of a continuing inshore-offshore and pollock CDQ allocation may preserve stability in the groundfish industry, while clearing the way for continuing development of a CRP management system. The industry is in a different state than existed in 1990 as a consequence of many factors outside the scope of the Council process,

as well as the inshore-offshore allocation. The Council intends that staff analyze the effects of rapidly reauthorizing an interim inshore-offshore allocation relative to maintaining stability in the industry during the CRP development process, as well as the consequences of not continuing the present allocation. These alternatives are appropriate as they address the problem of maintaining stability. Therefore, the focus of analysis to be done over the next few months should assist the Council to:

(1) Identify which alternative is least likely to cause further disruption and instability, and thus increase the opportunity for the Council to accomplish its longer-term goal of CRP management.

(2) Identify the future trade-offs involved for all impacted sectors presented by the two alternatives.

The Council's original Problem Statement from 1990 is also incorporated by reference, as the original preemption problem is still a very real factor to consider, if the program is allowed to sunset at the end of 1995. Because the program is scheduled to sunset in 1995, Council action will be required no later than June of 1995 to keep the program going for an additional three year period. Action by the Council in June would allow for Secretarial review and approval by the start of the 1996 fishing year. No new regulations or infrastructures would be necessary for (continued) implementation of the program under this schedule.

1.2 ALTERNATIVES

The Council has identified the following two alternatives for consideration in this amendment package:

Alternative 1: No Action - the current inshore-offshore allocation and the pollock CDQ program would expire at the end of 1995.

Alternative 2: Continuation of the current program, as is, for a period of three additional years. This would include the pollock CDQ program as an unseverable element of the overall package.

In developing these alternatives, the Council feels that major changes, such as changes in the percentage allocations, would be likely to: (1) require significant new and complex economic analyses, (2) create undo debate over basic management policy by the Council, (3) be inconsistent with their overall intent to deal with the issue on a more long-term, comprehensive basis through CRP, and (4) create unnecessary delays in implementing the continuation. Because of these concerns, and because the Council intends minimal disruptions to the fishing and processing industry, they have submitted only two basic alternatives for consideration, as shown above. The specifics of the current Amendment 18/23 are described in the previous section of this document.

Notwithstanding the desire to keep the alternatives simple and to a minimum, the Council has identified two specific areas for possible re-evaluation: (1) the Catcher Vessel Operational Area (CVOA), and (2) the definition of inshore and offshore vessels as it pertains to freezer longliners. Information has been requested on these two issues and is provided in subsequent sections of this document. The Council may or may not choose to revise Amendment 18/23 with regard to these two provisions. The full list of provisions of the current Amendment 18/23 is provided below for reference:

Summary of Current Inshore - Offshore Allocation Effective Through December 31, 1995

(1) Definitions, Rules, and Allocation.

Relative to definitions, rules and allocations for inshore and offshore components of the Gulf of Alaska (GOA) pollock and Pacific cod fisheries and the Bering Sea and Aleutian Islands (BSAI) pollock fisheries:

A. Definitions

The following definitions shall apply:

Offshore: The term "offshore" includes all catcher/processors not included in the inshore processing category and all motherships and floating processing vessels which process groundfish [pollock in the BSAI or pollock and/or Pacific cod in the GOA] at any time during the calendar year in the Exclusive Economic Zone.

Inshore: The term "inshore" includes all shorebased processing plants, all trawl catcher/processors and fixed gear catcher/processors whose product is the equivalent of less than 18 metric tons round weight per day, and are less than 125 feet in length, and all motherships and floating processing vessels, which process pollock in the BSAI or pollock and/or Pacific cod in the GOA at any time during the calendar year in the territorial sea of Alaska.

Trawl Catcher/Processor: The term "trawl catcher/processor" includes any trawl vessel which has the capability to both harvest and process its catch, regardless of whether the vessel engages in both activities or not.

Mothership/Floating Processing Vessel: The term "mothership" or "floating processing vessel" includes any vessel which engages in the processing of groundfish, but which does not exercise the physical capability to harvest groundfish.

Harvesting Vessel: The term "harvesting vessel" includes any vessel which has the capability to harvest, but does not exercise the capability to process, its catch on a calendar year basis.

Groundfish: The term "groundfish" means pollock and/or Pacific cod in the GOA and pollock in the BSAI.

B. Rules

The following rules shall apply to both the Gulf of Alaska, and the Bering Sea and Aleutian Islands:

1. Each year, prior to the commencement of groundfish processing operations, each mothership, floating processing vessel, and catcher-processor vessel will declare whether it will operate in the inshore or offshore component of the industry. A mothership or floating processing vessel may not participate in both, and once processing operations have commenced, may not switch for the remainder of the calendar year. For the purpose of this rule, the Gulf of Alaska, the Bering Sea and the Aleutian Islands are viewed as one area, and groundfish applies to all of the species combined which have been allocated to one component or the other.

2. A mothership or floating processing vessel which participates in the inshore component of the industry shall be limited to conducting processing operations on pollock and Pacific cod, respectively, to one location inside the territorial sea, but shall be allowed to process other species at locations of their choice.

3. If during the course of the fishing year it becomes apparent that a component will not process the entire amount, the amount which will not be processed shall be released to the other components for that year. This shall have no impact upon the allocation formula.

4. Harvesting vessels can choose to deliver their catch to either or both markets (e.g., inshore and offshore processors); however, once an allocation of the total allowable catch (TAC) has been reached, the applicable processing operations will be closed for the remainder of the year unless a surplus reapportionment is made.

5. Allocations between the inshore and offshore components of the industry shall not impact the United States obligations under the General Agreement on Tariffs and Trade.

6. Processing of reasonable amounts of bycatch shall be allowed.

7. The Secretary of Commerce would be authorized to suspend the definitions of catcher/processor and shoreside to allow for full implementation of the Community Development Quota program as outlined in the main motion.

C. Allocations

The following allocations shall apply:

1. Gulf of Alaska

Pollock: One hundred percent of the pollock TAC is allocated to harvesting vessels which deliver their catch to the inshore component. Trawl catcher/processors will be able to take pollock incidentally as bycatch.

Pacific cod: Ninety percent of the TAC is allocated to harvesting vessels which deliver to the inshore component and to inshore catcher/processors; the remaining ten percent is allocated to offshore catcher/processors and harvesting vessels which deliver to the offshore component. The percentage allocations are made subarea by subarea.

2. Bering Sea/Aleutian Islands

Pollock: The Bering Sea/Aleutian Islands pollock TAC shall be allocated as follows:

Years	Inshore	Offshore
1993-1995	35.0%	65.0%

These percentage allocations apply to the TAC after subtracting 7.5 percent of the TAC for the Western Alaska Community Development Quota program, previously approved by the Secretary for 1992-1995.

3. Unused Allocations

If during the fishing year it becomes apparent that either the inshore or offshore sector cannot fully harvest its allocation, the excess shall be released to the other component, without affecting the allocation formula in future periods.

(2) Catcher Vessel Operational Area

A Catcher Vessel Operational Area is defined for pollock harvesting and processing during the pollock "B" season (starting on June 1 unless changed), encompassing the area between 168 and 163 degrees W. longitude, and 56 degrees N. latitude south to the Aleutian Islands. The following operational rules apply to the CVOA:

A. Shore based catcher vessels delivering pollock from a directed fishery to inshore plants or inshore motherships may operate in the CVOA if an inshore allocation remains unharvested.

B. Offshore motherships and their associated catcher vessels also may operate in the CVOA if an offshore-allocation remains unharvested.

1.4 REGULATORY IMPACT REVIEW (E.O. 12866) REQUIREMENTS

Regulatory Impact Review. Executive Order 12866, "Regulatory Planning and Review," was signed on September 30, 1993, and established guidelines for promulgating and reviewing regulations. While the executive order covers a wide variety of regulatory policy considerations, the benefits and costs of regulatory actions are a prominent concern. Section 1 of the order deals with the regulatory philosophy and principles that are to guide agency development of regulations. The regulatory philosophy stresses that, in deciding whether and how to regulate, agencies should assess all costs and benefits of all regulatory alternatives. In choosing among regulatory approaches, the philosophy is to choose those approaches that maximize net benefits to society.

The regulatory principles in E.O. 12866 emphasize careful identification of the problem to be addressed. The agency is to identify and assess alternatives to direct regulation, including economic incentives, such as user fees or marketable permits, to encourage the desired behavior. When an agency determines that a regulation is the best available method of achieving the regulatory objective, it shall design its regulations in the most cost-effective manner to achieve the regulatory objective. Each agency shall assess both the costs and benefits of the intended regulation and, recognizing that some costs and benefits are difficult to quantify, propose or adopt a regulation only upon a reasoned determination that the benefits of the intended regulation justify its costs. Each agency shall base its decisions on the best reasonably obtainable scientific, technical, economic, and other information concerning the need for, and consequences of, the intended regulation.

The National Marine Fisheries Service (NMFS) requires the preparation of a Regulatory Impact Review (RIR) for all regulatory actions that either implement a new Fishery Management Plan (FMP) or significantly amend an existing plan. The RIR is part of the process of preparing and reviewing FMPs and provides a comprehensive review of the changes in net economic benefits to society associated with proposed regulatory actions. The analysis also provides a review of the problems and policy objectives prompting the regulatory proposals and an evaluation of the major alternatives that could be used to solve the problems. The purpose of the analysis is to ensure that the regulatory agency systematically and comprehensively considers all available alternatives so that public welfare can be enhanced in the most efficient and cost-effective way. The RIR addresses many of the items in the regulatory philosophy and principle of E.O. 12866.

E.O. 12866 requires that the Office of Management and Budget (OMB) review proposed regulatory programs that are considered to be significant. A "significant" regulatory action is one that is likely to:

(1) Have an annual effect on the economy of $100 million or more, or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities.

(2) Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency.

(3) Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof, or

(4) Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in this Executive Order.

A regulatory program is "economically significant" if it is likely to result in the effects described in item (1) above. The RIR is designed to provide information to determine whether the proposed regulation is likely to be "economically significant."

C. Offshore catcher-processors cannot target on pollock in the CVOA during the "B" season.

D. Access to the CVOA is unrestricted during the pollock "A" season.

(3) Western Alaska Pollock Community Development Quota Program.

For a Western Alaska Pollock Community Development Quota, the Council instructs the NMFS Regional Director to hold 50% of the BSAI pollock reserve as identified in the BSAI Groundfish Fishery Management Plan (FMP) for release to communities on the Bering Sea Coast who submit a plan, approved by the Governor of Alaska, for the wise and appropriate use of the released reserve. Criteria for Community Development Plans shall be submitted to the Secretary of Commerce for approval as recommended by the State of Alaska after review by the NPFMC.

The Western Alaska Community Quota program will be structured such that the Governor of Alaska is authorized to recommend to the Secretary that a Bering Sea Rim community be designated as an eligible fishing community to receive a portion of the reserve. To be eligible a community must meet the specified criteria and have developed a fisheries development plan approved by the Governor of the requesting State. The Governor shall develop such recommendations in consultation with the NPFMC. The Governor shall forward any such recommendations to the Secretary, following consultation with the NPFMC. Upon receipt of such recommendations, the Secretary may designate a community as an eligible fishing community and, under the plan, may release appropriate portions of the reserve.

(4) Duration.

If by December 31, 1995, the Secretary of Commerce has not approved the FMP amendments developed under a Comprehensive Rationalization Program, the inshore-offshore and Western Alaska Community Development Quotas shall cease to be a part of the FMPs.

1.3 NEPA REQUIREMENTS

An Environmental Assessment (EA) is required by the National Environmental Policy Act of 1969 (NEPA) to determine whether the action considered will significantly impact the human environment. An Environmental Impact Study (EIS) must be prepared if the proposed action may reasonably be expected to: (1) jeopardize the productive capability of the target resource species or any related stocks that may be affected by the action; (2) allow substantial damage to the ocean and coastal habitats; (3) have a substantial adverse impact on public health or safety; (4) affect adversely an endangered or threatened species or a marine mammal population; or (5) result in cumulative effects that could have a substantial adverse effect on the target resource species or any related stocks that may be affected by the action. An EA is sufficient as the environmental assessment document if the action is found to have no significant impact (FONSI) on the human environment.

An EA must include a brief discussion of the need for the proposal, the alternatives considered, the environmental impacts of the proposed action and the alternatives, and a list of document preparers.

1.5 ORGANIZATION OF THE DOCUMENT

Chapter 1 of this document introduced the issue, provided an overview of the history of Amendment 18/23, and summarized the alternatives under consideration. NEPA, Magnuson Act, and Executive Order 12866 requirements were also provided in Chapter 1. Chapter 2 will provide a summary of the findings from previous analyses of Amendment 18/23 and then will describe the overall analytical approach for this iteration - the proposed reauthorization of Amendment 18/23. Also included in Chapter 2 will be a summarization of the key issues and indices which will be examined in this document.

Chapter 3 describes the "base case" for the analysis in terms of harvests, CPUE, and bycatch, for example. This Chapter is designed to describe the current state of the fisheries as a baseline for eventual comparisons of the alternatives under consideration. The description in Chapter 3 includes BSAI fisheries for pollock, GOA fisheries for pollock and Pacific cod, and a description of activities in the CVOA. Chapter 4 provides the "base case" descriptions for the economic and social indices such as markets, processors, and harvesting fleets for each of the two major industry sectors involved. The "base case" is defined as the state of the industry and affected communities in 1993 and 1994 as data are available. Included in these chapters are discussions of how the "base case" has changed from that used in the original analyses.

Chapters 5 and 6 use the "base case" descriptions as a basis upon which to project the outcomes under the two alternatives. These sections will focus on the non-CDQ industry sectors and communities. Chapter 7 will tie Chapters 3-6 together and make conclusions regarding the overall net impacts and changes which could occur under the two alternatives. Included in Chapter 7 is a section discussing stability and the future trade-offs for the affected sectors. Additionally, there is a discussion of potential directional changes in the estimates of net benefits found in the original analysis. Primarily this section compares parameters used in the original analysis to parameters from the assessment of the "base case" and projected outcomes from the current analysis to the extent possible, given the quality and availability of data. Because of the lack of recent cost information, we do not make explicit use of the models developed in the original analysis. This section also examines the compliance of the alternatives to E.O. 12866. Other sections in Chapter 7 include NEPA compliance, a Fishery Impact Statement, and discussions regarding compliance with IRFA and CZMA.

Chapter 8 examines community impacts, focusing on the same key communities as were examined in the original Social Impact Assessment. These communities were Newport, Ballard/Seattle, Kodiak, Sand Point/King Cove, St. Paul, and Dutch Harbor. This chapter summarizes previous findings, describes major changes which have occurred since 1991, and discusses likely impacts of the current proposal. Chapter 9 contains an examination of the Pollock CDQ program. This chapter, more or less a stand-alone analysis, describes the current situation and makes projections regarding the affected CDQ communities with and without the reauthorization of Amendment 18/23.

Chapter 10 has been added since this EA/RIR was first made available to the public in May 1995. This chapter contains a summary of the Council's action approving the reauthorization of Amendments 18 and 23 for three years from 1996 through 1998, with some minor adjustments to the Catcher Vessel Operational Area. In reauthorization, these amendments will become Amendment 38 to the BSAI Groundfish FMP and Amendment 40 the GOA Groundfish FMP. Chapter 10 also includes a summary of information which became available after the EA/RIR was released in May. It includes information on water quality in Dutch Harbor/Unalaska, 1994 product price data and 1993 production data. These data do not change the conclusions made in the original document, but are included for the record. Additionally a set of "replacement tables" is included at the end of the chapter. The replacement tables may be compared to those in the body of the document to see the impacts of the more recent data.

2 ANALYTICAL APPROACHES - PREVIOUS AND CURRENT ANALYSES

A brief summary of the findings of the original analyses for Amendment 18/23 is provided in this chapter. This is due to the direct linkage that exists between the original and the current issues, and the fact that we will be including the original analysis by reference in the current package. Without this direct reference and linkage, the original analysis would have to be respaded in its entirety. The reference point for comparison of the alternatives in this analysis, however, will be the current situation, i.e., the "base case," as defined by the 1993 and 1994 fisheries. This Chapter provided an overview of the basic methodologies employed, the key parameters of those analyses, the bottom line findings of the analyses in terms of distributional and net benefit impacts, and other factors and rationale which were critical to the Council's decisions.

The documents summarized below include: (1) the "Final Supplemental Environmental Impact Statement (SEIS) for Amendment 18/23," dated March 5, 1992, prepared by Council staff; (2) the "Cost-Benefit Analysis of Pollock and Pacific Cod Quota Allocations in the BSAI and GOA Groundfish Fisheries," dated April 14, 1992, prepared by the NMFS Economics Special Studies Team; and (3) the "Supplementary Analysis of Proposed Amendment 18 Inshore-Offshore Allocation of Pollock in the BSAI," dated September 3, 1992, prepared by NMFS and Council staff.

Though each of these studies is relevant to the issue, and each approaches the issue from a slightly different perspective, primary attention here will be given to the third document, the Supplementary Analysis dated September 3, 1992. However, considerable discussion is devoted to the concept of input/output modeling as it forms the basis for both of the analyses performed by Council staff. This discussion is excerpted from the original analysis. Community impacts are discussed separately in Chapter 8 and the pollock CDQ program is discussed separately in Chapter 9. Much of the discussions in the following sections are excerpted from the previous analytical documents.

2.1 FINAL SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT (SEIS) FOR AMENDMENT 18/23 DATED MARCH 5, 1992

This document is the original inshore-offshore analysis which includes all of the primary alternatives originally under consideration. It includes separate impact projections for both the BSAI and the GOA, while the final Supplementary Analysis is specific to the BSAI allocations.

2.1.1 General Analytical Methods

Because this analysis examined an array of alternatives, some of which were not associated with a direct quota allocation to industry sectors, a variety of analytical tools was utilized, varying depending on the alternative examined. For our purposes in considering the reauthorization, the relevant portion of that analysis is examination of alternatives involving the direct percentage allocation of the fisheries (Alternative 3 and the Preferred Alternative 8). That examination was primarily based on an input/output modeling exercise described below:

Input-Output Analysis

Input-output analysis is an established technique for measuring the interaction between associated inputs and outputs in an economy.[1] This methodology utilizes estimates of the degree of interaction among all components

[1]Wassily Leontief is credited with developing input-output analysis as a tool for economic research during the 1930s based on his study of interdependencies in the U.S. Economy. For a more contemporary explanation of input-output models and their application in economic analysis, see Miernyk, *The Elements of Input-Output Analysis*, or Miller and Blair, *Input-Output Analysis: Foundations and Extensions.*

in a given economic community. In the context of specific allocations, input-output analysis is a useful procedure for assessing the direct and indirect economic impacts of changes in the allocation of the pollock and Pacific cod resources among industry segments. Increases in pollock processing volume, for example, can be traced not only to the *direct* impacts on employment or income, but to the *indirect* impacts on supporting service sectors, such as input suppliers, insurance, and finance. In addition, input-output analysis provides estimates of the *induced* economic impacts created by changes in economic activity not directly connected to the catching and processing activity. Induced economic activity might arise from wage and salary expenditures by fishing industry workers on non-industry related items, such as home furnishings or health services.

Because the U.S. economy is highly interdependent upon goods and services from throughout the nation, some portion of the consequences of economic activity in one specific location almost always "leak" out to other regions. Normally, the smaller the economic location defined, the greater the leakage to the larger national economy. Less developed economic locations, such as those represented by remote fishing communities in Alaska, also experience significant leakage of economic impacts to major supply and support centers, such as Seattle.

Input-output analysis can address both the magnitude and distribution of economic impacts. The intricate measurement of the complex interactions among the various economic segments is achieved through the mathematic calculation of coefficients representing the observed economic associations among these components. The data requirements for such measurements are immense, and beyond the scope of the analysis presented here. However, established input-output models are available that make use of U.S. national data bases to estimate these critical relationships.

The input/output model used in this analysis allows for the examination of economic impacts at the community, regional, and national level, providing estimates of direct, indirect, and induced effects.[2] This basic model has been used in studies of fishery resource allocation in the Pacific states, allowing for community level examination of economic impacts. As such, this procedure is not the estimation of an input-output model; rather, the use of estimated input-output coefficients to calculate economic impacts.

The locations of primary interest for this analysis that are contained in the model include: Dutch Harbor, Akutan, and St. Paul, Alaska in the Bering Sea; Kodiak, Sand Point, and King Cove, Alaska in the Gulf of Alaska; the Alaska, Washington, and Oregon state level economies; and the U.S. national economy. Specific borough-level models of the respective Alaska locations were developed in recognition of the unique nature of these communities, relative to the larger state or regional economies. For relevant Washington or Oregon fishery-related ports, specifically Seattle (Ballard), Washington, the state level economy was judged to be a fair representation of the associated county level economy, particularly with regard to the fishing industry.

<u>The Basic Logic of the Input-Output Analysis</u>

The model provided by Jensen and Radtke is fundamentally a disaggregated model of the input-output coefficients for specific locations. The actual catching and processing activity associated with each of the port locations was entered into the model subsequently by Council staff analysts. The resulting effort provides a working model of the economic impacts of pollock, Pacific cod, and other operationally-linked species (i.e., flatfish, rockfish, halibut, etc) as these resources move from catcher to processor, and from processor to further processing or the market. For example, trawl or fixed gear catcher vessels delivered specific tonnages to processors, for which fishermen received a given price per ton. These revenues can then be traced back through operating costs, crew shares, and other expenditures, to measure the direct economic impacts, at the catcher level,

[2] A user's reference document prepared by Jensen, "Evaluating the Economic Impact of Natural Resource Economics," is available from the NPFMC office in Anchorage.

of a given tonnage of the resource. The direct impacts give rise to indirect and induced impacts from the same tonnage.

This approach is based on the relatively simple measurement of expenditures made in catching and processing, and traces the resulting dollar impacts through known or estimated economic relationships in a given location. As such, the analysis is predictive, rather than prescriptive in nature; the results model what will likely happen, not what should be done.

The Relationship Between Input-Output Analysis and Cost-Benefit Analysis

Justification for adopting a change in Fishery Management Plans requires that the potential benefits to society from the regulation outweigh potential costs to society. The selection of analytical methodologies used to make such an assessment is based on both the nature of the problem under consideration, and the information available to investigate the problem. The foregoing discussion examined the nature of the economic issues under consideration, along with the rationale for use of an input-output model to assess the magnitude and distribution of allocations prescribed under selected alternatives. For purposes of clarification, it may be instructive to contrast the methodology used in this analysis with a cost-benefit type approach, often applied in public sector management.

Conceptually, cost-benefit analysis entails the measurement of all benefits and costs arising from a particular project or program. Aggregated results of such an analysis form the basis for empirical assessments as to whether or not benefits exceed costs. The comparison of benefit/cost ratios also is used as a basis for selection of the single "best" alternative; that is, the one with the "highest" ratio of benefits to costs. A change is said to be desirable so long as the aggregated improvements (benefits) exceed the aggregated costs of such action. A project may be socially desirable if the benefits exceed the costs given that gainers could be made to compensate losers. The fact that there is no compensation required is not necessarily a consideration in cost-benefit analysis. Benefit-cost analysis can be interpreted as component of welfare economics, although practical applications rarely satisfy the rigorous demands of the theoretical model.[3]

In practice, cost-benefit analysis can pose demanding information requirements, since conceptual costs and benefits ultimately must be expressed in some comparative quantitative framework. This can create significant difficulties in enumeration and evaluation, particularly for diverse or complex projects that contain intangible or indeterminate outcomes. Relevant costs and benefits include not only the private sector calculations of profitability and expenditures, but also the less tangible concept of public benefits and costs. Moreover, cost-benefit analysis does not offer a convenient means of examining the distribution of economic impacts, an issue central to the analysis of allocation decisions such as the inshore-offshore proposal. In the past, this methodology has been employed regularly in the evaluation of capital projects such as dams, fish hatcheries, and other public works. Such analyses typically exhibit a predictable stream of capital costs and economic benefits accruing over time, which are then discounted to a comparable present value basis for comparison of costs and benefits.

While the casual reference to, or partial examination of, benefits and costs is common in the allocation of natural resources, the thorough enumeration and evaluation of these effects are seldom undertaken or achieved. A review of contemporary EIS, SEIS, and RIR documents dealing with fishery allocation issues reveals that the use of qualitative or narrative descriptions, generalized per unit resource values, inventories of various attributes, and broad generalizations of social value are commonly used to derive judgements of net national economic impact, rather than the rigorous quantitative estimation of consumer and producer surplus called for in theoretical models

[3]The terms "cost-benefit" and "benefit-cost" often are used interchangeably in referring to this procedure. For a more in depth discussion of cost-benefit analysis, the reader is referred to the collected articles contained in Prest and Turvey, *Cost Benefit Analysis: A Survey*. A comparison of input-output analysis and cost-benefit analysis is available in the NMFS Technical Report #94, "An Economic Guide to Allocation of Fish Stocks between Commercial and Recreational Fisheries," by Edwards.

of welfare economics. Comprehensive estimates of aggregate demand for natural resources are frequently unavailable to provide quantitative, thorough measures of consumer benefits and costs.

This does not imply that cost-benefit analysis of natural resource allocation issues is inherently flawed, or inappropriate. Rather, that the theoretical rigor called for in comprehensive cost-benefit analyses of these issues often exceeds the scope of practical applications. Thus, it is important to differentiate between considerations of costs and benefits on one hand, and definitive conclusions regarding net national economic benefits, on the other. The former does not necessarily lead to the latter. Despite such obstacles, cost-benefit analysis still provides a conceptual standard for framing analyses in the recognition that all costs and benefits need to be systematically examined and compiled in measures of overall social welfare.

Input-output analysis is not the same as cost-benefit analysis. Input-output analysis is concerned with estimating economic impacts—including benefits and costs—but provides no absolute criteria for selecting among alternatives. Input-output analysis allows for the systematic examination of economic benefits and costs resulting from a change in economic activity such as would accompany the allocations proposed in the proposed amendment. Input-output analysis does not necessarily measure or define economic variables in the same manner prescribed by cost-benefit analysis, so the input-output findings must be carefully interpreted when applied to conclusions regarding net economic benefits. In this regard, the strength and weaknesses of the input-output model used in this analysis are emphasized in presentation of the results.

A fundamental consideration in the design of analytical methodology is matching the nature of the problem to a suitable research procedure. The nature of the problem dictates the appropriate analytical tool. The problem recognized by the Council in the proposed Amendment 18/23 is clearly a resource allocation issue, closely linked to the distribution of economic effects associated with resource allocation. Conclusions regarding whether or not regulatory actions are justified in the interest of net national benefits are tied directly to this issue. In order to assess the economic impacts and distributional effects of alternative allocations, the input-output procedure was elected by the analytical team as the appropriate analytical tool, given the dimensions of the problem, data available, and time allowed for the investigation. Consideration of costs and benefits, including an assessment of net national economic impacts, is derived from information provided in the input-output analysis, as well as the investigation of other economic variables outside the context of the input-output model.

2.1.2 Primary Parameters of Analysis

The input/output modeling described above utilizes the following types of inputs to determine distributional impacts of the alternative allocation scenarios:

(1) employment,
(2) wage and salary income,
(3) business profits or losses,
(4) costs of production,
(5) quantity of fish input available,
(6) species and product mix,
(7) price levels for inputs and outputs,
(8) product and market shares, and
(9) expenditures within the affected communities.

Table 2.0 on the next page contains the values for these parameters as used in the original SEIS.

This set of economic variables can be used to characterize both the inshore and offshore sectors of the industry. In the larger perspective, the impact of the competitive actions among and between the two respective sectors influences a still broader population of businesses and ultimately consumers nationwide. To the extent that the affected fisheries involve foreign interests, there are international economic variables such as trade regulations, world markets, and foreign investment to consider, as well.

This analysis focuses on the impacts of the proposed management alternatives in their effort to reduce the problems associated with preemption. The economic impacts are estimated based on examination of the variables specified above, primarily in terms of the operations of catcher and processor firms directly involved in the affected fisheries. These costs and benefits also are aggregated and cast in terms of their consequences on the affected local communities, both in Alaska and the Pacific Northwest, as well. Where evidence is available, the likely impacts of these proposals on the aggregate United States economy also are developed in the context of impacts on consumer prices, resource utilization, and production efficiency. Because the amendment proposals directly impact the resource allocation of the fisheries involved, the *distribution* of the benefits and costs associated with these economic variables, both at the local and national level, is a critical measure of the resultant economic impacts.

Table 2.0

Parameters used in Original Input-Output Analysis for the GOA

Sector	Species	Product	Delivered Price	Yield (PRR)	Raw Cost	Labor Cost	Other Cost	Variable Cost Total	Sales Price	Contribution to Margin
Offshore	Pollock	Surimi	$ 0.06	14%	$ 0.45	$ 0.14	$ 0.25	$ 0.85	$1.03	$ 0.18
		Fillets	$ 0.06	17%	$ 0.38	$ 0.19	$ 0.25	$ 0.82	$1.05	$ 0.23
		Roe	$ 0.06	5%	$ 1.30	$ 0.15	$ 0.52	$ 1.97	$3.80	$ 1.83
	Pacific Cod	Fillets	$ 0.12	20%	$ 0.60	$ 0.24	$ 0.33	$ 1.17	$1.85	$ 0.68
		H&G	$ 0.12	60%	$ 0.20	$ 0.15	$ 0.10	$ 0.45	$0.52	$ 0.07
Inshore	Pollock	Surimi	$ 0.08	18%	$ 0.44	$ 0.11	$ 0.14	$ 0.69	$0.80	$ 0.11
		Fillets	$ 0.08	20%	$ 0.40	$ 0.31	$ 0.16	$ 0.87	$0.98	$ 0.11
		Roe	$ -	100%	$ -	$ 0.44	$ 0.22	$ 0.66	$2.52	$ 1.86
		Block	$ 0.08	28%	$ 0.29	$ 0.25	$ 0.13	$ 0.67	$0.85	$ 0.18
	Pacific Cod	Fillets	$ 0.15	21%	$ 0.71	$ 0.37	$ 0.20	$ 1.28	$1.73	$ 0.45
		H&G	$ 0.12	60%	$ 0.20	$ 0.15	$ 0.10	$ 0.45	$0.52	$ 0.07

Parameters used in Original Input-Output Analysis for the BSAI

Sector	Species	Product	Delivered Price	Yield (PRR)	Raw Cost	Labor Cost	Other Cost	Variable Cost Total	Sales Price	Contribution to Margin
Offshore	Pollock	Surimi	$ 0.05	14%	$0.35	$0.14	$0.25	$ 0.74	$1.03	$ 0.29
		Fillets	$ 0.07	17%	$0.41	$0.19	$0.25	$ 0.85	$1.05	$ 0.20
		Roe	$ 0.06	5%	$1.20	$0.15	$0.52	$ 1.87	$3.80	$ 1.93
	Pacific Cod	Fillets	$ 0.12	20%	$0.60	$0.24	$0.33	$ 1.17	$1.85	$ 0.68
		H&G	$ 0.12	60%	$0.20	$0.15	$0.10	$ 0.45	$0.52	$ 0.07
Inshore	Pollock	Surimi	$ 0.08	18%	$0.44	$0.11	$0.14	$ 0.69	$0.80	$ 0.11
		Fillets	$ 0.08	20%	$0.40	$0.31	$0.16	$ 0.87	$0.98	$ 0.11
		Roe	$ -	100%	$ -	$0.44	$0.22	$ 0.66	$2.52	$ 1.86
		Block	$ 0.08	28%	$0.29	$0.25	$0.13	$ 0.67	$0.85	$ 0.18
	Pacific Cod	Fillets	$ 0.15	21%	$0.71	$0.37	$0.20	$ 1.28	$1.73	$ 0.45
		H&G	$ 0.12	60%	$0.20	$0.15	$0.10	$ 0.45	$0.52	$ 0.07

2.1.3 Summary of Findings

Because the analysis was based on an input/output model geared to the community level (for four Alaska and two Pacific Northwest communities), the results of the analysis are primarily in terms of direct and indirect changes in income at the combined regional, and national levels.

From this analysis it is evident that the allocations result in income losses for the Pacific Northwest in general, which are more than offset when compared to the income gains for Alaska overall, and for local Alaska regions independently. Total U.S. income increases proportionately greater than the income gains experienced for Alaska. This is reflective of the overall analytical findings from that analysis. Essentially, dollars (and employment) generated in Alaska communities/regions are worth more than dollars generated in, for example, Bellingham. This is due to the cycle of expenditures and economic activity associated with a given level of income in a community or region. In small coastal communities the multiplier effects of a given dollar are much greater; the money tends to stay in the community and produce a proportionally greater degree of economic activity.

Additionally, a given degree of economic activity generated by those dollars is of proportionally greater significance to a community or region lacking alternative income bases or economic activities. This is the very nature of effects that input/output modeling is designed to capture. What is not fully accounted for in this process are associated economic efficiencies, which when considered start to move towards the area of overall net benefits to the nation. In this decision, the Council weighed obviously positive distributional impacts against uncertain overall net benefit impacts, mitigated further by what the Council considered to be positive social impacts. The Council's consensus was that a direct allocation of pollock and/or Pacific cod TACs in the GOA and BSAI was the most appropriate means of offering a timely—though perhaps interim—solution to the inshore-offshore preemption problem. A direct allocation also represented the most explicit and predictable means of resolving the preemption concerns raised in the proposed amendment.

Citing directly from the SEIS, the following excerpt summarizes predicted impacts: "Economic impacts arising from Alternative 8 are projected to fall between those estimated under Alternative 3.1 and 3.3 in the BSAI, and Alternative 3.3 and 6 in the GOA. Combining the inshore and offshore regional impacts yields a net gain in direct income in year one of $8.5-9 million, and a loss of 175-200 FTEs. The employment losses in the Alaska-PNW region are projected to be slightly greater than the job gains, but associated increases in economic activity in the rest of the nation result in a modest gain in FTE employment nationwide. The regional net gain in direct income is a function of the more labor intensive operations of the inshore sector, rather than any inherent advantage in economic efficiency. Qualitative estimates suggest that the net national effects of the preferred alternative are positive under normative assumptions. Such benefits incorporate the economic effects noted above, as well as positive national impacts created by: 1) maintaining a balance in the social and economic opportunities associated with the pollock and Pacific cod fisheries; 2) helping insure that the fishery resources are available to provide private and community benefits to all parties; and 3) reducing the uncertainty and operational instability caused by the threat of preemption. It is intended that the pollock and Pacific cod allocations made for the GOA and BSAI are in the best interest of resource management and the nation at large."

2.2 COST-BENEFIT ANALYSES OF POLLOCK AND COD QUOTA ALLOCATIONS IN THE BSAI AND GOA GROUNDFISH FISHERIES DATED APRIL 14, 1992

This analysis was conducted by NMFS, partly due to concern that the original analysis conducted by Council staff, though providing detail on distributional effects, was vague on the issue of overall net benefits to the nation. The analysis by NMFS was primarily geared to evaluate economic efficiencies associated with the proposed allocations, and therefore generate net benefit to the nation estimates.

2.2.1 General Analytical Methods

Essentially, the methodology employed by the NMFS analysts was to measure producer surplus for each sector and then predict the relative producer surplus changes for each sector - inshore and offshore, under both the "with" and "without" allocation cases. The difference between total producer surplus with the allocation and the total producer surplus without the allocation forms the base for the estimate of the overall net benefits to the Nation resulting from the action. This involved estimation, for each sector, of relative harvest percentages, product mixes, recovery rates, and prices for fish. From this estimate total revenues are projected, then subtracted from total estimated costs of production, to arrive at net benefits for each sector. The difference between the two (assuming one is positive and one is negative) is the overall net benefit to the nation.

2.2.2 Primary Parameters of Analysis

The primary parameters which drive the calculation of the cost-benefit model are (by sector) harvest, product recovery rates, product mix, product price, and cost of production. These key parameters were the subject of intense debate during consideration of Amendment 18/23, and were shown to impact the results in the analyses considerably. Additional discussion of these parameters and their significance in the model results, is provided in the next section where we discuss the final analysis prepared by the combined NMFS/Council staff analytical team.

2.2.3 Summary of Findings

The analysis performed by the NMFS analytical team projected a net economic loss to the nation of $181 million over the life of the allocation, assuming the three year phase-in of percentages which would culminate with a 45/55 inshore-offshore split. This is derived by comparison of offshore sector losses of $619 million against inshore sector gains of $438 million. A risk analysis was performed which tested the sensitivity of the input parameters and evaluated the various probabilities of outcomes across the range of possibility. This assessment calculated a near zero probability of overall positive net benefits, and identified the range of losses as being as little as $15 million to as high as $350 million, again with an expected value of $181 million.

It is again important to note that the assumptions regarding the input parameters were the subject of intense debate and could have significant effects on the overall findings. It is also true that this analysis was primarily focused on overall economic efficiencies and ignores the distributional income effects, relative values of jobs and dollars at community/regional levels, and the overall social implications of the alternatives. Nevertheless, the results of this analysis were at least partially instrumental in the Secretary's disapproval of the BSAI portion of Amendment 18/23. The projected levels of economic loss to the nation were significant enough that the Secretary requested the Council to reevaluate the percentages originally recommended in the allocation. Following that disapproval, Council and NMFS staff collaborated on a third, Supplementary analysis, prior to the Council's reconsideration of Amendment 18 (for the BSAI only, as the GOA allocations were approved).

2.3 SUPPLEMENTARY ANALYSIS OF PROPOSED AMENDMENT 18 - INSHORE-OFFSHORE ALLOCATION OF POLLOCK IN THE BSAI DATED SEPTEMBER 3, 1992

Following the Secretarial disapproval on March 4, 1992, Council and NMFS staff began a reevaluation of specific alternatives for the BSAI portion of the inshore-offshore allocations. The draft analysis was made available on July 9, 1992 for public review, with the Council taking final action in August of 1992. This analysis looked specifically at two alternatives to the status quo: (1) a 30/70 inshore-offshore split for the duration of the program, 1993-1995, and (2) the three year phase-in of percentages as originally recommended and disapproved by the Secretary.

The first alternative, a fixed 30/70 split, was chosen as it was thought at the time of the proposal to approximate the actual division which was estimated for 1991. (After additional analysis, the "actual division" in 1991 was found to be closer to 26/74.) The effect of choosing this alternative would be to essentially freeze the allocation at the level currently being experienced, thereby precluding potential preemption. The second alternative was included in this analysis based on concerns that the cost-benefit analysis previously used to estimate net national benefits may have incorrectly specified certain variables, leading to an overstated estimate of net losses to the nation. Objectives of the revised analysis included:

1. a cost-benefit analysis of the revised alternatives;
2. an updated assessment of distributional (employment and income) impacts;
3. an more detailed examination of the CVOA options; and
4. a summary of social considerations pertinent to the revised alternatives.

This final analysis represents a revised combination of the two previous analyses; i.e., it examines both the issue of distributional economic impacts and the issue of overall cost-benefit impacts at a national level. Updated values were generated for several of the key parameters in both types of analysis where information was available. As is explained in further detail below, two alternative sets of values were utilized in the overall cost-benefit analysis. **Although summaries of the two previous analyses have been provided above, it is this, the third and final analysis, which is considered by the analysts to be the most accurate and relevant point for referencing findings from the original Amendment 18, although it only applies to the BSAI pollock fishery.**

2.3.1 Cost-Benefit Assessment

2.3.1.1 General Analytical Approach

In conducting the Supplemental Analysis, updated values for key variables (parameters) were obtained from various primary and secondary sources. Recognizing that these values were instrumental in assessing overall economic performance, and because there was so much debate over the accuracy of these values, two alternative data scenarios were employed by the analysts. These two data scenarios differed primarily with regard to product prices and product recovery rates (PRRs). Cost estimates for each sector's operations were updated from the original analysis simply be applying a producer price index. Additional detail on these parameters is provided in the following section. Generally, the analytical approach was identical to that employed in the previous analysis conducted by the NMFS analytical team - that approach is to measure producer surplus for each sector and then to predict the relative changes in that producer surplus for each sector - inshore and offshore.

This involved estimation, for each sector, of relative harvest percentages, product mixes, recovery rates, and prices for fish. From this estimate total revenues are projected, then subtracted from total estimated costs of production, to arrive at net benefits for each sector under each alternative. The difference between the two (assuming one is positive and one is negative) is the overall net benefit to the nation. Benefits, for the purpose of this analysis, represent net gains in economic efficiency as measured by changes in producer surplus (or rent) in the inshore and offshore sectors. Producer surplus represents the change in producer revenue resulting from the allocations minus changes in operating costs and new economic investment.

The analysis focused on pollock production in the BSAI area only, and on principal product types, although it is recognized that the operating units, vessels and plants, produce a variety of species and product types. The processed products incorporated in the analysis included surimi, fillets, minced products, roe and meal. Within this general framework, the analysts determined, the relative harvests of pollock, quantities of the various processed products, revenues received for those products, and the associated production costs for each sector.

2.3.1.2 Key Parameters in the Analysis

Key parameters used in the estimation of revenues and costs for each sector included: total allowable catch (TAC), harvest by sector (total projected catch), landings by sector (catch minus discards), product mix, product recovery rates, production levels, product prices, and costs for each sector. As noted earlier, two sets of variables were utilized in the examination of each alternative - one set generated by NMFS and Council staff and referred to as the NMFS scenario, and one set generated by industry, referred to as the industry scenario. Table 2.1 below provides an example from that document which focuses on the prices used in the projections of impacts. Similarly, Table 2.2 below shows the PRR assumptions utilized by the analysts.

Table 2.1 1991 Bering Sea and Aleutian Island Processed Pollock Price Estimates ($/lb)

Sector	Product	NMFS Scenario		Industry Scenario	
		average price	standard deviation	average price	standard deviation
Offshore	Roe	$5.38	$2.40	$4.87	$2.46
	Fillets s/b	$1.28	$0.24	$1.42	$0.24
	Surimi	$1.50	$0.22	$1.57	$0.22
	Mince	$0.71	$0.16	$0.87	$0.16
	Meal	$0.24	$0.02	$0.28	$0.02
Inshore	Roe	$3.79	$0.20	$3.79	$0.20
	Fillets s/b	$1.49	$0.29	$1.49	$0.29
	Surimi	$1.26	$0.29	$1.47	$0.29
	Mince	$0.68	$0.18	$0.68	$0.18
	Meal	$0.26	$0.02	$0.26	$0.02

Table 2.2 Product Recovery Rate Assumptions by Scenario and Sector

Sector/ Product	NMFS	NMFS/Team Scenario				Industry Scenario			
	1991[a]	mode	low	high	expected[b]	mode	low	high	expected
Offshore Roe	14%	5%	3%	7%	5.0%	10.0	6.0%	14.0%	10.0%
Fillets	25%	17%	13%	22%	17.3%	23.5	22.0%	25.0%	23.5%
Surimi	15%	18%	14%	21%	17.7%	17.5	14.0%	21.0%	17.5%
Mince	34%	25%	20%	34%	26.3%	29.0	22.0%	36.0%	29.0%
Meal	17	16%	14%	18%	16.0%	18.0	17.0%	19.0%	18.0%
Inshore Roe	14%	3%	2%	6%	3.7%	5.3%	2.5%	8.0%	5.3%
Fillets	25%	18%	14%	22%	18.0%	24.5	22.0%	27.0%	24.5%
Surimi	15%	19%	15%	21%	18.3%	20.0	18.0%	22.0%	20.0%
Mince	34%	25%	20%	34%	26.3%	29.0	22.0%	36.0%	29.0%
Meal	17%	17%	15%	19%	17.0%	13.8	8.5%	19.0%	13.8%

Notes: [a]NMFS product recovery rates for pollock were revised in 1992 from these 1991 rates.
[b]Expected values are calculated as the average of the low, high and mode values.

The other variables in the analysis were structured in the same way as the example Tables above, so that the analysis projected a range of outcomes, depending on which set of variables was chosen, for each alternative.

2.3.1.3 Summary of Findings

Using the techniques and data presented in the previous section, the analysis calculated annual changes in net benefits, measured against Alternative 1 (status quo), as a result of implementing either Alternative 2 or Alternative 3. The analysts then calculated the net present value (NPV) of the net benefits accrued over the life of the program (1993 through 1995), using a 5% real discount rate. Table 2.3 presents results based on the NMFS parameter and price estimates, and Table 2.4 displays results based on calculations that incorporate the industry parameter estimates.[4] The table distinguishes between surplus gains/losses accruing to vessels and the comparable gains/losses realized by vessel crews that are compensated on a share basis. The surplus (positive or negative) attributed to vessels and/or plants in all cases accounts for labor costs whether these represent shares or fixed wage payments. The surplus attributed to crew represents the expected "rent" earned or lost by share labor calculated from the uniform distribution described above.

Alternative 2: 30/70 Percentage Split for Three Years

The Alternative 2 program allocates 30% of the adjusted TAC to the inshore sector and 70% to the offshore sector through the life of the program. According to calculations based on "NMFS parameters", Alternative 2 would result in a loss of $22 million to society over the effective period of the program. Of this total, $17.2 million represents a loss in producer surplus accruing to vessels/plants and a $4.9 million loss in crew rents (see Table 2.3). When the industry parameter estimates are used in the analysis (see Table 2.4), the expected net loss in benefits under Alternative 2 is $16.7 million, which includes $11.3 million in net producer losses to vessels\plants and a $5.4 million expected loss in crew rents, where crew rents range from -$10.8 million to zero.

Alternative 3: Three Year Phase-in of 35/65, 40/60, and 45/55 Percentage Split

Under Alternative 3, the inshore sector allocation in the first year of the program (1993) is 35% and then increases to 40% and 45% in the succeeding two years. The corresponding shares to the offshore sector are 65%, 60% and 55%. Based on NMFS parameter estimates (see Table 2.3), this alternative yields a cumulative loss of $85.8 million in net benefits, of which $66.8 million is the loss experienced by vessels/plants and $19.0 million is a loss in crew rents. The offshore sector under this alternative gives up $228.3 million in benefits ($194 million without expected losses in crew rents), while the inshore sector gains $142.6 million or ($127.2 million without expected gains in crew rents). The calculation of changes using the industry parameter estimates (see Table 2.4) puts the net loss at $69.8 million ($47.2 million without crew rents), which represents $251.4 million in expected producer losses ($213.7 million without crew rents) for the offshore sector and $181.5 million ($166.5 million without expected crew rents) in expected gains for the inshore sector. Under either the NMFS or the industry scenario of parameters, it is important to note that the net loss projections are significantly reduced from the $181 million loss projected for the same alternative in the previous NMFS analysis.

The risk analysis incorporates knowledge of the uncertainty of the many key variables necessary for the analysis and indicates that the probability of positive net benefits is 9.9% from Alternative 2 and 10.4% from Alternative 3, using calculations based on the NMFS data. Calculations based on the industry parameter estimates place the probabilities of positive benefits at 15.3% for both alternatives. These probability distributions are illustrated in Figures 2.2, 2.3, 2.4, and 2.5.

[4]Tables 8 and 9 present results of implementing the alternatives selected for analysis by the Council. Tables C and D in the Appendix summarize the net benefits in a display that allows the calculation of net results for various other allocation combinations.

Based on the assumptions and data employed, the cost-benefit analysis indicated that given the present state of technology and market environment (present defined as 1992), the offshore sector is the more economically efficient in terms of utilization of the BSAI pollock stock. The net economic losses associated with diverting offshore pollock production to shore based operators stem from the capability, at least now, of the offshore sector to convert the resource into a higher valued product at lower relative costs. This advantage in efficiency is adequate to more than compensate for the fact that offshore production has a somewhat lower resource utilization rate (i.e., higher discards and lower recovery rates) than production by inshore plants.

The results of these modeling efforts were shown to be very sensitive to even minor changes in parameters. As will be shown below, in Chapter 2.3.4, the results of the Council's final Preferred Alternative show a reduction in net losses attributable to the allocation, and even potential net benefits, under certain assumptions.

Table 2.3 Net benefits (losses) in millions of dollars to the inshore and offshore sectors resulting from proposed allocations, by year, using NMFS estimates, with Net Present Value for life of program

		1993	1994	1995	NPV (5% real rate)
Alternative 3		35% / 65%	40% / 60%	45% / 55%	
Inshore	Vessel	$7.7	$12.3	$16.9	$33.0
	Plant	$21.9	$35.0	$48.0	$94.1
	Crew[1]	$3.6	$5.7	$7.9	$15.4
	Total	$33.2	$53.0	$72.8	$142.6
Offshore	Vessel	($45.2)	($72.1)	($99.0)	($194.0)
	Crew[1]	($8.0)	($12.8)	($17.5)	($34.4)
	Total	($53.2)	($84.9)	($116.6)	($228.3)
Net	Vsl/Plnt	($15.6)	($24.8)	($34.1)	($66.8)
	Crew[1]	($4.4)	($7.0)	($9.7)	($19.0)
	Total	($20.0)	($31.9)	($43.8)	($85.8)
Alternative 2		30% / 70%	30% / 70%	30% / 70%	NPV
Inshore	Vessel	$3.1	$3.1	$3.1	$8.5
	Plant	$8.9	$8.9	$8.9	$24.2
	Crew[1]	$1.5	$1.5	$1.5	$4.0
	Total	$13.4	$13.4	$13.4	$36.6
Offshore	Vessel	($18.3)	($18.3)	($18.3)	($49.8)
	Crew[1]	($3.2)	($3.2)	($3.2)	($8.8)
	Total	($21.5)	($21.5)	($21.5)	($58.6)
Net	Vsl/Plnt	($6.3)	($6.3)	($6.3)	($17.2)
	Crew[1]	($1.8)	($1.8)	($1.8)	($4.9)
	Total	($8.1)	($8.1)	($8.1)	($22.0)

[1]Expected crew surplus (loss) given a uniform distribution of potential crew surplus from zero to the full change in crew share-based payments.

Table 2.4 Net benefits (losses) in millions of dollars to the inshore and offshore sectors resulting from proposed allocations, by year, using Industry estimates, with Net Present Value for life of program

Alternative 3 In/Off Allocation		1993 35% / 65%	1994 40% / 60%	1995 45% / 55%	NPV (5%real rate)
Inshore	Vessel	$7.4	$12.0	$16.5	$32.2
	Plant	$30.9	$50.0	$69.0	$134.4
	Crew[1]	$3.5	$5.6	$7.7	$15.0
	Total	$41.7	$67.5	$93.3	$181.5
Offshore	Vessel	($49.1)	($79.5)	($109.8)	($213.7)
	Crew[1]	($8.7)	($14.0)	($19.4)	($37.7)
	Total	($57.8)	($93.5)	($129.1)	($251.4)
Net	Vsl/Plnt	($10.8)	($17.5)	($24.2)	($47.2)
	Crew[1]	($5.2)	($8.4)	($11.7)	($22.7)
	Total	($16.1)	($26.0)	($35.9)	($69.8)
Alternative 2 In/Off Allocation		30% / 70%	30% / 70%	30% / 70%	NPV
Inshore	Vessel	$2.8	$2.8	$2.8	$7.7
	Plant	$11.8	$11.8	$11.8	$32.2
	Crew[1]	$1.3	$1.3	$1.3	$3.6
	Total	$16.0	$16.0	$16.0	$43.5
Offshore	Vessel	($18.8)	($18.8)	($18.8)	($51.2)
	Crew[1]	($3.3)	($3.3)	($3.3)	($9.0)
	Total	($22.1)	($22.1)	($22.1)	($60.2)
Net	Vsl/Plnt	$(4.1)	($4.1)	($4.1)	($11.3)
	Crew[1]	($2.0)	($2.0)	($2.0)	($5.4)
	Total	($6.1)	($6.1)	($6.1)	($16.7)

[1]Expected crew surplus (loss) given a uniform distribution of potential crew surplus from zero to the full change in crew share-based payments.

Figure 2.2 Results of risk analysis showing probability of different levels of net benefits for alternative 2, using NMFS parameter estimates

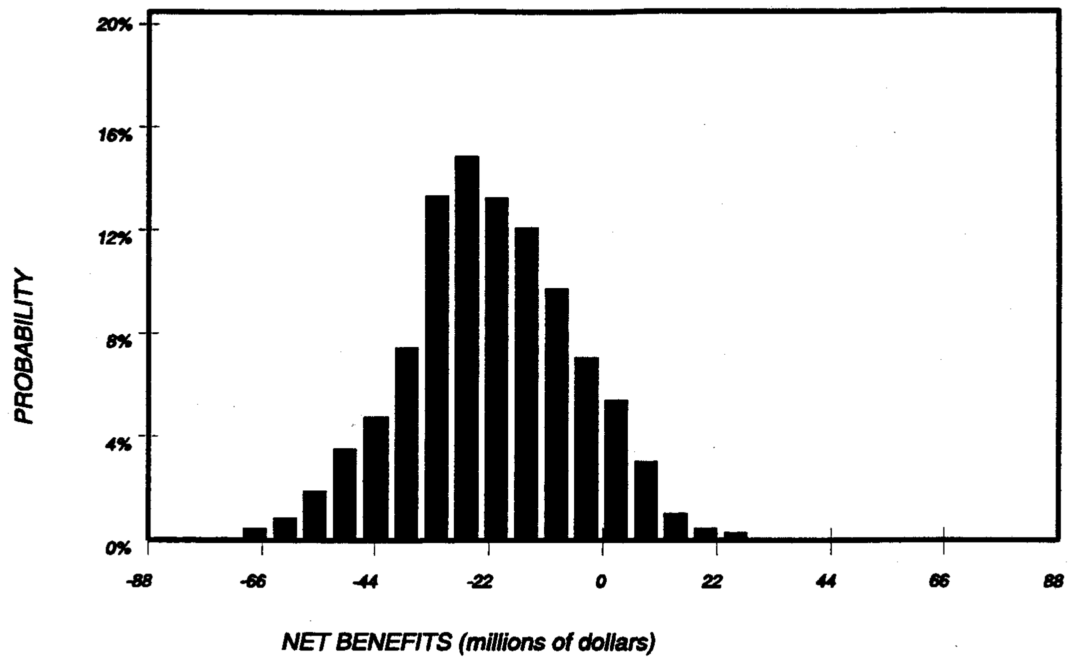


Figure 2.3 Results of risk analysis showing probability of different levels of net benefits for alternative 3, using NMFS parameter estimates.

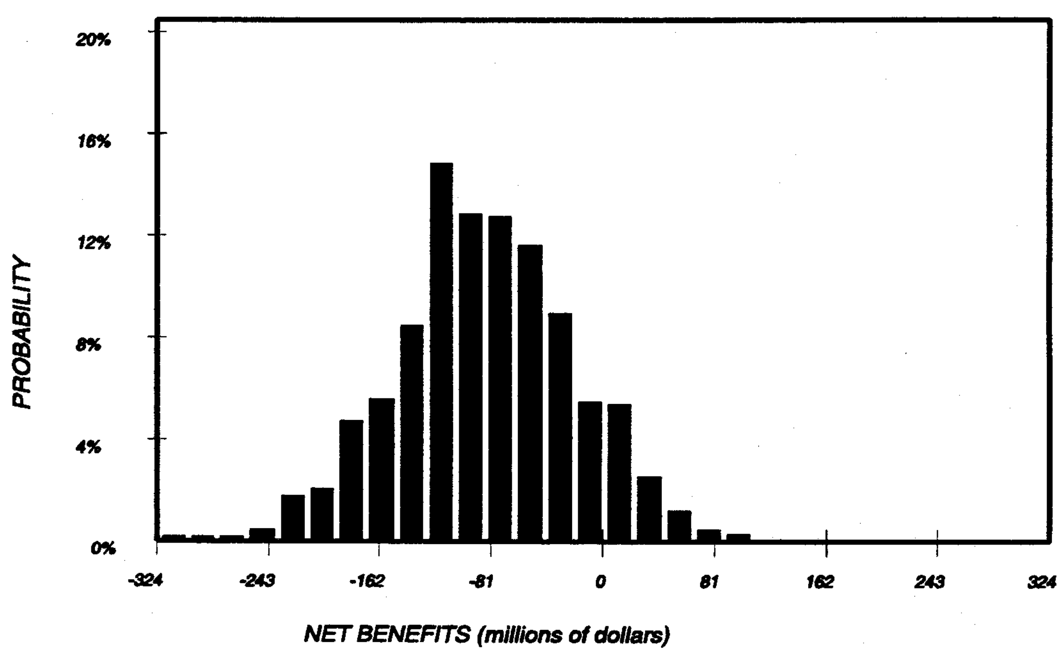


Figure 2.4 Results of risk analysis showing probability of different levels of net benefits for alternative 2, using Industry parameter estimates

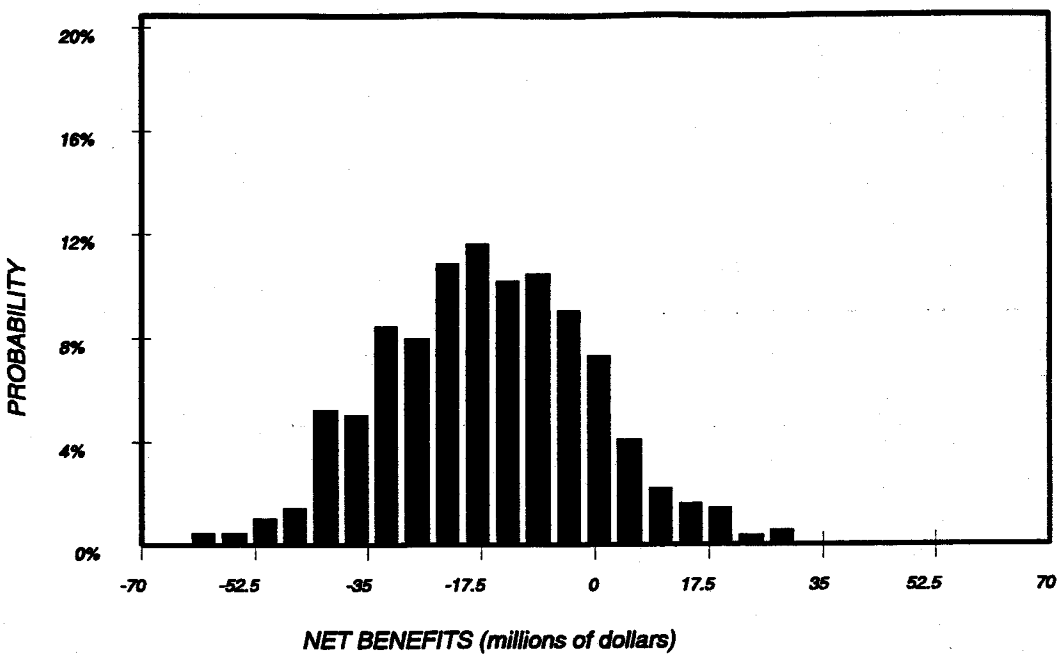
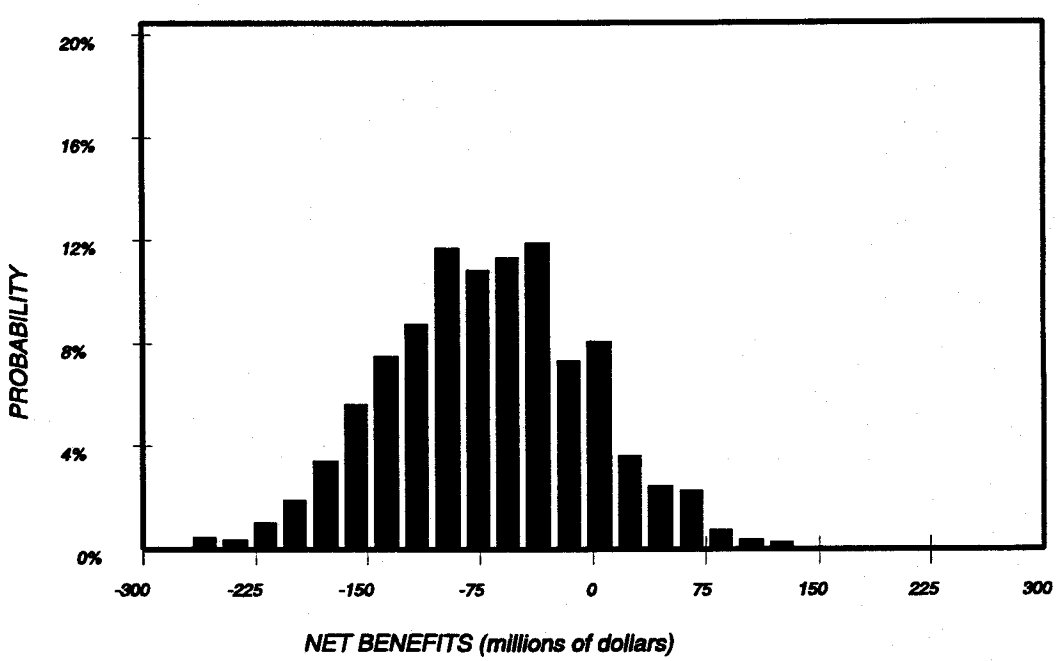


Figure 2.5 Results of risk analysis showing probability of different levels of net benefits for alternative 3, using Industry parameter estimates



2.3.2 Economic Impact (Distributional) Analysis

2.3.2.1 General Analytical Approach

The content and scope of input/output analysis have been described in some detail in Chapter 2.1 above. The model basically measures impacts on direct income, employment, and total economic activity associated with changes in the Alaska groundfish industry. These results are applied at the local, regional, and national economy levels. In order to establish a common point of reference with the cost-benefit analysis described above, data were updated to 1991. Thus, both components of the economic analysis rely on the same data concerning catch shares, costs, revenues, product mix, PRRs, and discards.

The scope of the model was modified to include only the BSAI fisheries in this iteration of analysis. As in previous input/output modeling exercises, the communities of focus included Kodiak, Sand Point, St. Paul, Unalaska, and the Pacific Northwest. The economic impact model was run over the two alternative scenarios developed by the analytical team. While there are important differences between the NMFS and Industry data assumptions, the revision from the 1989/90 base to the 1991 base results in changes that are many times greater than the differences between the NMFS and Industry scenarios. Generally, product prices and recovery rates used in this supplementary analysis are significantly higher than those that existed in 1989. For example, reported offshore surimi recovery rates increased nearly 30 percent, and surimi prices increased over 50 percent. Although recovery rates and prices increased dramatically between 1989 and 1991, production costs have been relatively small, at least as captured by the PPI, which suggests a nominal 4 percent increase in producer costs since 1989.

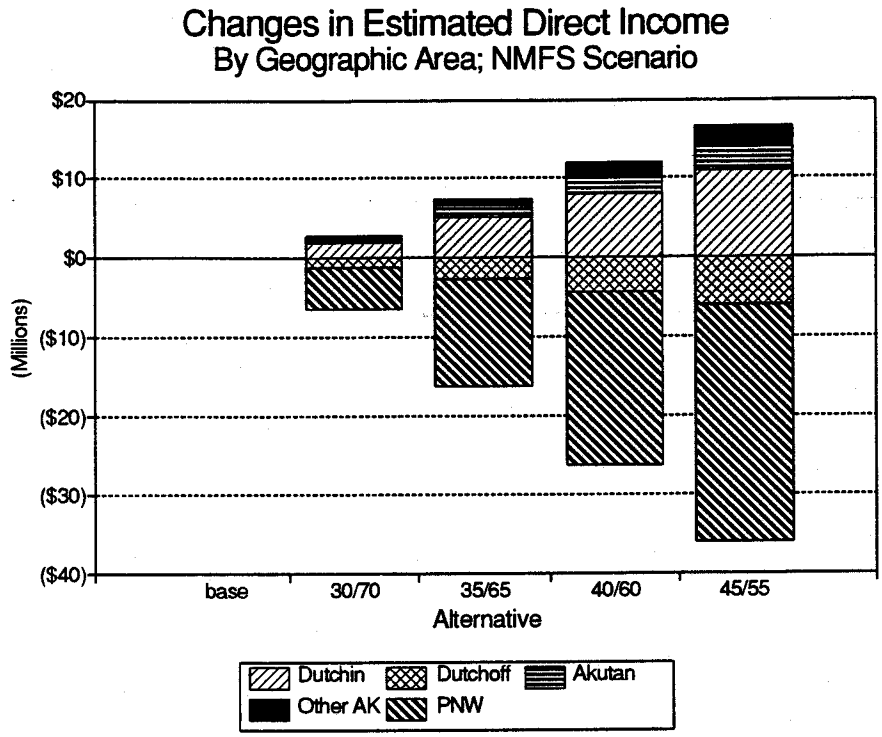
The combined effect of these effects was to significantly increase the net returns to both inshore and offshore operators—processors in particular, since exvessel pollock prices had shown only modest gains during this time. Secondly, the relative change from 1989 to 1991 in recovery rates and product prices between the inshore and offshore sectors has been variable in response to changes in competition, plant operations, technology, and resource availability. As a consequence, the results of the inshore-offshore alternatives as examined in this supplementary analysis are often different than those developed in the original SEIS based on 1989 conditions.

2.3.2.2 Summary of Findings

Fundamentally, the impact of the proposed alternatives is to preferentially allocate some portion of the BSAI pollock TAC from the offshore sector to the inshore sector. The economic impact model traces the effects of this incremental change in pollock tonnage as it is taken away from the offshore sector, and added to the inshore sector. The income and employment impacts resulting from the additional inshore tonnage and revenues are compared to the impacts arising from the offshore loss, and associated with the economic level or locations where these impacts will occur. Because the estimation procedure employed in the economic impact model is linear, the change in results is proportional to the change in the underlying allocation. Figure 2.6 below, which depicts estimated changes in direct income for each proposed percentage split, provides a graphic example of the proportional changes as the allocation split moves from one end of the spectrum to the other.

This figure is based on the NMFS scenario of input values, though the results are nearly identical when using the Industry scenario values. As shown is this figure, the greatest income impacts are incurred by the PNW, followed by inshore Dutch Harbor, offshore Dutch Harbor, Akutan, and other Alaska. As developed in the SEIS, the PNW is a broadly defined economic region, generally represented by Seattle, although numerous cities and smaller communities are included in the regional impacts. Seattle is the home port and headquarters for much of the offshore industry, as well as a significant part of the inshore processing industry. Although Seattle and the PNW are often considered as the economic location of the offshore fleet, both components of the industry have important economic ties in the PNW.[5] Similarly, Dutch Harbor serves both the inshore and offshore components, and the respective inshore and offshore dependencies have be estimated for this port in order to distinguish between operations of the two components.

Figure 2.6



The effect of the preferential allocations is to increase the direct incomes accruing to inshore operations in Alaska proportional to the size of the inshore allocation, at the expense of offshore operations in Alaska, and the PNW in general. The offshore losses in direct income are relatively greater than the inshore gains, resulting in a net loss in direct incomes. Similar results were found in examining employment impacts.

The economic impact model captures all direct income initially at the local, state, or regional level, and adjusts the income and other expenditure values for estimated subsequent payments to foreign owners or workers. The estimates illustrated in these figures reflect the calculated incomes after deducting foreign payments. Estimates of foreign ownership and payments are discussed and reported in the original SEIS. The impact of deductions for foreign payments is substantial for both sectors.

<u>Summary of Impacts for 30/70 Split</u>

In the case of the 30/70 split, the calculated impact was based on the status quo shares of 26.6 percent inshore and 73.4 percent offshore for the NMFS scenario, and 26.9/73.1 percent for the industry scenario. Under the assumptions and data scenarios used in the analysis, the allocation would result in relatively modest shifts in direct income and employment away from the offshore sector to the inshore sector. The annual direct income gains to the combined inshore Dutch Harbor, Akutan, and other Alaska locations is estimated to be about $3.2

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[5]Based on the expenditure and distribution assumptions used in the economic impact model, approximately 25 percent of the direct income accruing to the PNW in the base case (status quo) is attributable to Dutch Harbor and Akutan inshore catching and processing operations.

million, accompanied by an annual increase of approximately 150 FTEs.[6] The impact on the combined offshore sector is estimated to be a loss of roughly $6.5 million annually in direct income, and 600 FTEs. Recall that the aggregate direct income impacts accrue initially in the Alaska and PNW locations, while the FTE impacts are nation wide.

Over the three year duration of the proposed allocation, the annual economic impacts estimated using this methodology would remain the same, in that no subsequent adjustment by catchers and processors is accounted for in the model. The present value of the three year cumulative change in direct income stream, assuming a 5 percent real social discount rate is a gain of approximately $8.7 million for the affected inshore communities, and a loss of $17.9 million for the offshore locations. The apparent net impact to the nation over the three year period is a loss of $9.3 million in direct income, and 530 FTEs.

Summary of Impacts for Three Year Phase-in (35/65, 40/60, 45/55)

This alternative proposed successively larger allocations to the inshore sector, starting from a 35/65 split, and increasing by five percent of the TAC in each of the next two years. The annual direct income and employment impacts increase proportionately as a result. The present discounted value of the inshore gains is $34.9 million, accompanied by an increase of roughly 530 FTEs. The corresponding offshore loss is approximately $72.6 million, and 2,160 FTEs, resulting in a net national loss of $37.3 million in direct income, and 1,885 FTEs, over the life of the allocation.

2.3.3 Analysis of Catcher Vessel Operational Area (CVOA)

Because the Council has requested a detailed reexamination of the CVOA in the current consideration of reauthorization of Amendment 18/23, a summary of the previous CVOA analysis from 1992 is provided here. Rationale for inclusion of the CVOA as part of Amendment 18/23 included:

1) The shore based harvesting sector relies almost entirely on the CVOA. In 1989, over 99% of the shore base processed pollock was harvested inside the area [NPFMC, 1992a]. In 1991, the shore based harvester relied less on the inshore zone, but still harvested over 93% from within the zone [ADF&G, 1991].[7]

2) Without the CVOA it was argued, the offshore sector would take all the pollock nearshore then move offshore when all the fish nearshore had been taken, leaving the inshore sector without pollock to process.

3) Shore based catcher vessels need to deliver fish to processing facilities shortly after harvesting. If the pollock stocks near the plants had been fished out, then the catcher vessels would have to travel farther away perhaps beyond a range whereby timely deliveries of pollock are possible.

   Additionally the cost of making many long runs to and from the shore based plant soon fails to be cost effective.

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[6]The direct income and FTE estimates are the midpoints between the NMFS and Industry data scenarios. As illustrated in Figures 3c and 3f, the aggregate differences between the two NMFS and Industry scenarios is relatively minor in terms of these calculated impacts.

[7]The Fish Ticket Database contains catch information based on 1° longitude by 1/2 latitude blocks, and therefore it is possible to estimate the dependence on the CVOA by the different sectors. Weekly processor reports detail catch by management zones, part of four of which comprise the CVOA. Fish ticket data is deemed by NMFS to be less reliable than the weekly processor reports by which they manage the fishery. In fact, the 1991 fish tickets showed the total pollock catch to be 1.03 million mt, while the weekly report data estimated total pollock catch to be 1.36 million mt a difference of 25%.

4) Much of the perceived pre-emption problem arises from the fact that the offshore sector has the mobility to fish wherever they like. Shore based catcher vessels are much more limited. The CVOA, it is argued would eliminate this aspect of the pre-emption problem by creating a zone in which only catcher vessels may operate.

There were also many arguments against the CVOA. These included:

1) The CVOA is an important part of the offshore harvest. In 1989, it was estimated that 55% of the offshore sector's total pollock harvest came from within the zone. In 1991, fish ticket data showed only 26% of the offshore sector harvest came from within the zone (again the shortcomings of the fish ticket data should be noted).

2) It is argued that if forced out of the zone for the entire year the offshore sector could face greater bycatch problems. The bycatch of prohibited species could mean shorter seasons and more political turmoil.

3) It is thought that the size of pollock outside the zone is less than the size of the pollock inside the zone. If pollock are too small (< 25cm) they become impossible to process with Baader 182 filleting machines [Chitwood, 1992]. Even if they are large enough to process, the machines are limited to a given number of fish per hour, and therefore small fish are more costly to process [Wood, 1992]. Additional it is claimed that pollock are less uniform in size outside the zone than inside the zone. With more variance in size, the filleting machines need to be adjusted more of ten, or set such that product recovery rates suffer. Either way the cost of production increases.

4) It is said that the catch per unit effort (CPUE) is less outside the CVOA than inside the CVOA. Smaller CPUEs mean a more costly operation.

5) If as expected the offshore sector will go north and west, toward the Pribilof Islands, if the CVOA is implemented, it is argued that there will be more gear conflicts between crabbers and trawlers. The area around the Pribilofs, while hosting large quantities of pollock, is used extensively for crabbing in the fall and winter months.

6) As in #5 above, a shift northward and westward pushes vessels into waters more susceptible to rough seas and ice. It is argued that even were pollock stocks available, they could be inaccessible in the first quarter because of the ice edge. Further, harvest vessels delivering to motherships face increased costs to run to port for provisions.

The analysis of the Catcher Vessel Operational Area examined the characteristics of the fish populations, fishing practices, and other factors prevalent in the BSAI both inside and outside the CVOA. Eight issues which shed light on the practices of the industry and ramifications of the CVOA were examined:

1) Historical and projected pollock removals from the CVOA.
2) Pollock length frequency data.
3) Catch per unit effort.
4) Bycatch of prohibited species.
5) Sector dependence on the CVOA.
6) Catcher Vessel and Processing Constraints.
7) Ice and weather conditions.
8) Gear Conflicts.
9) Marine Mammals and Seabirds.

The detailed analyses from that analysis are not reiterated here; rather, the conclusions of that analysis are summarized below for each of the nine issues listed above:

Historical and Projected Removals of Pollock in the CVOA

The overall average level of removals between 1980 and 1991 from the CVOA was 445,123 mt. Since 1986 (the end of data from foreign fishing), the average has been 682,123 mt, and since 1989 (the end of significant JV fishing), the average has been 510,922 mt. If only inshore delivery vessels are allowed to participate in the CVOA, projected removals could range from 380,280 mt to 570,420 mt, with allocation from 30% to 45% going to the inshore sector. If mothership deliveries are allowed, up to 35,000 mt more are projected to be removed from the CVOA. If 65% of offshore "A" Season processing is allowed inside the CVOA, then 196,098 mt (with a 30% inshore allocation) dropping down to 154,077 mt (with a 45% inshore allocation) could possibly be removed from the CVOA.

Length Frequency Data

Length frequency information shows that over the period 1981-1991, the pollock on average are longer inside the CVOA than outside the CVOA. The difference, though significant from a statistical point of view is small, from 2 to 4 cm. There was very little likelihood that the size of pollock, either inside or outside the CVOA, were less than 30 cm on average, which according to industry sources is a minimum length. The data also show that the location of harvest does not account for much of the variance in length over the different years, and that in any given quarter it is not easy to predict whether fish harvested within the CVOA are longer than fish harvested outside. Clearly the dynamics of the pollock biomass are not fully explained by the location of harvest.

Catch Per Unit Effort

An examination of CPUE inside and outside the CVOA showed no significant differences overall. There were specific quarters in different fisheries for which CPUEs were significantly greater inside the CVOA than outside and vice versa. It is difficult to say whether any of the differences found were the result of actual differences in CPUE, the result of comparing "apple and oranges," or the because the data and models used were inadequate to capture the complexity of the issue. Clearly the fleet is changing over time and effort patterns are changing as well. Using information from the past to predict future effects is at best, a tool for understanding complex issues rather than as an actual predictor.

Bycatch of Prohibited Species

Bycatch of prohibited species is an issue both inside and outside the CVOA. It appears that *C. bairdi*, and halibut bycatch rates may be higher inside the CVOA than outside. Bycatch rates of other Tanner crab appear higher outside than inside the CVOA. There may be some evidence to indicate that salmon and herring bycatch rates are higher inside than outside the CVOA, but without further study it may be premature to make that assessment. Finally, there appears to be no significant difference in bycatch rates of red king crab. All of these apparent findings are preliminary and should be used with caution. Given the dynamics of the different biomasses, and in the fishing industry itself, interactions between the two are highly speculative.

Sector Dependence on the CVOA

Catcher vessels, shore based processors, and motherships—both inshore and offshore—appear to be more dependent (on a catch percentage basis) on the CVOA than do catcher/processors, and the offshore sector in general. It should be noted that according to industry sources shore based catcher vessels are ranging up to 200 miles during pollock trips. Although this somewhat contradicts the data found in ADF&G fish tickets, those data are known to have serious problems with accuracy, especially as used in this analysis.

Catcher Vessel Limitations and Processing Constraints

Pollock needs to be processed soon after it is caught. According to industry sources this maximum period may be as short as 30 hours or as long as 3 days. Catcher vessels delivering to a shoreside plant are clearly limited by this factor and by their vessel running speed. If profitability is considered, it is clearly more profitable to fish closer to the point of delivery than farther if CPUEs are the same. By the same token, it may be more profitable for catcher/processors to operate near ports to save time and money in reprovisioning, however catcher/processors were constructed to fish far from port so this may be less of a factor.

Ice and Weather Conditions

To the extent that the implementation of the CVOA shifts fishing activity into areas where ice and weather conditions are worse, the CVOA will negatively impact the those operations. Offshore mothership operations appear to be the most at risk due to the need of their catcher vessels to be able to run for shelter during inclement weather, and the fact that these operations would be excluded from the CVOA.

Gear Conflicts

Increased gear conflicts appear likely if implementation of the CVOA shift pollock operations into areas used heavily by the crab fleet during the late fall and winter.

Marine Mammals

Much of the potential for Stellar sea lion conflicts as a result of the CVOA appear to have been nullified with regulation set forth in Amendment 20 to the BSAI Fishery Management Plan. If, however, the implementation of the CVOA put additional fishing effort in area previously less used, then other seabird and marine mammals population may experience additional stress. NMFS Scientists in a Section 7 consultation with regard to the inshore-offshore proposal made a finding of no significant impact on marine mammals and seabirds in February of 1992.

2.3.3.1 Effects of the CVOA on the Outcomes in the Cost/Benefit Analysis[8]

The quantitative dollar effects of designating a CVOA are difficult to ascertain, given the conjectural nature of the impacts on catching and processing operations. Moreover, certain issues such as impacts on the marine environment, discards, and bycatch preclude definitive dollar valuation given the data available. It is impossible, however, to assess directional changes on the inshore and offshore sectors that could result from implementation of the CVOA, and qualitatively interpret the possible impacts on costs and benefits.

2.3.3.1.1 Costs and Benefits of CVOA to Catcher/Processors

Higher Cost for Fuel. Additional costs could result if catcher/processors have to run further to fishing grounds. However this cost is likely to be incremental because catcher/processors make generally less than 10 runs to and from an in-season port such as Dutch Harbor. Since the majority of fishing effort by catcher processors in the last three years has been outside the CVOA, few of these runs would be affected. Additionally, although fuel expenses are a very significant portion of operating cost, most of this occurs in daily operations rather than in running to and from port.

[8]Sections 2.3.3.1.1 through 2.3.3.2.5 are excerpted directly from the Chapter 4 of the "Supplementary Analysis" dated September 3, 1992.

Fish Finding Costs. If catcher/processors are forced into new areas they may not know where fish aggregations are located. However, the incremental increase in costs may be small because aggregations of pollock are notoriously dynamic, and fish finding costs occur regardless of where one is fishing.

Length of Fish. Smaller fish are more expensive to process because filleting machines are constrained by the number of fish they can handle per unit of time. It appears that fish are generally smaller outside than inside the CVOA, however only incrementally so. Additionally, since catcher/processors have spent relatively less time inside than outside the CVOA these costs will appear small when compared to the cost of processing significantly smaller amounts of pollock overall.

Greater Variance in the Length of Fish. The more variance in the size of fish the less the product recovery rate in general. This occurs because filleting machines are set for an average fish size; the more variance around the mean, the less consistent the fillets will be.

Higher CPUEs Outside CVOA. If the offshore sector experiences higher CPUEs outside the CVOA than inside, then fishing cost could drop. This possible benefit, however, is probably minor when compared with the higher costs associated with processing fewer fish due to a reduced allocation.

Summary of Cost/Benefits for the Catcher/Processors. Since the majority of fishing effort for the offshore sector already takes place outside the CVOA one can assume it is more profitable for those vessels to operate there. Otherwise they would operate at a higher rate inside the CVOA. Some individual vessels probably find it more profitable to operate inside the CVOA. Those vessels will likely experience higher costs. Overall, there are several factors which suggest that catcher-processor costs will increase incrementally due to the designation of a CVOA. On balance, the net economic impacts may be relatively small however, especially in comparison to the aggregate net losses due to a reduced allocation, as estimated in the cost benefit analysis.

2.3.3.1.2 Costs and Benefits of the CVOA on Mothership Operations

Costs or benefits incurred by mothership operations due to the imposition of a CVOA depends on whether they are allowed to operate inside the CVOA. If mothership operations are not allowed to operate inside the CVOA, they will experience the same cost/benefits outlined for the catcher/processors, perhaps to a greater degree because of mothership's greater relative dependence over time on the CVOA. Additionally, vessels delivering to motherships will experience higher costs due to increased running time to and from ports. If mothership operations are allowed to operate inside the CVOA, then none of the costs accruing to the catcher/processor sector because of the CVOA are likely to occur.

2.3.3.1.3 Costs and Benefits of the CVOA to Inshore Sector

The CVOA will benefit most vessels delivering to inshore plants based inside the CVOA. Vessels delivering to plants outside the CVOA will not likely accrue any benefits. Inshore delivery vessels will likely experience reduced fuel costs, because presumably all trips would occur inside rather than outside the CVOA. However, these smaller costs are viewed to be incremental because very few inshore delivery vessels made trips outside the CVOA. Additionally, any benefits due to the longer size of fish or smaller variability within the CVOA will also be insignificant because virtually all of this sector's pollock has come form the CVOA.

2.3.3.2 Summary of the Effects of the CVOA on Industry Sectors

The effects of the CVOA are different depending on which sector of the industry is examined. There are five relevant sectors; (1) offshore catcher/processors, (2) offshore mothership operations, (3) inshore mothership operations, (4) shore based processing plants, and (5) shore based catcher vessels. The effects of the CVOA on each of these sectors may be further categorized as follows; (1) effects of implementing a CVOA regardless of the allocation, (2) effects of implementing the CVOA that depend on the size of the allocation, and (3) effect of not implementing the CVOA if there is an allocation. The likely impacts on each identified sector will be examined in light of these three considerations.

2.3.3.2.1 Offshore Catcher/Processors

Under the CVOA, offshore catcher/processors will be not be allowed to fish in an area in which they have in the past. The extent of the offshore sector's reliance on the CVOA is different depending on the criteria chosen; catch, profitability, operational safety, convenience, etc. Regardless, the CVOA will mean a change in the way these vessels operate. Perhaps the most damaging effect is the loss of the option to fish the CVOA if it is profitable (the option value). If the CVOA is implemented and the offshore catcher/processors move, for example, off the Pribilofs, displacing harvest efforts of a Pribilof-based fleet, then the preemption issue could rise again, requiring perhaps a "Pribilovian Vessel Operation Area."

It can be reasoned that the greater the allocation to the inshore sector, the less the effect of the CVOA on the offshore sector. For example, if the allocation were such that the offshore sector were allocated an amount equal to the amount they harvested outside the CVOA, then the offshore sector could simply forego their activities in the CVOA and be relatively no worse off had the CVOA not been implemented. From this point of view, every ton allocated above that amount harvested outside the CVOA will increase any cost resulting from the offshore sector's inability to use the zone.

Conversely, the greater the allocation to the offshore sector, the less the net loss (as estimated in the cost-benefit analysis). If the implementation of a CVOA imposes additional costs on the offshore sector, then the more they are allowed to harvest outside the CVOA, the more they will be able to offset the additional costs.

In the absence of a CVOA, the offshore catcher/processors are given the latitude to operate in which ever area is most conducive to their individual objectives, and this would be expected to enhance efficiency.

If the CVOA were not implemented, regardless of the allocation, the offshore sector would likely face continued allegations of preempting shore based operations in the area. These political costs may be offset by reduced operating expenses, if they exist, from operating within the CVOA.

2.3.3.2.2 Offshore Mothership Operations

Offshore mothership operations will also be affected by the implementation of the CVOA, but much of the effect will depend on the extent to which motherships are allowed to operate inside the CVOA. For simplicity, the analysis will assume that the regulation of a future CVOA will prohibit motherships from operating in the CVOA, as is the case in the 1992 regulations.

If the CVOA excludes mothership from processing within the CVOA, this eliminates at-sea delivery vessel from using the CVOA, which appears contrary to the designation of a catcher vessel operational area. The CVOA has been important to offshore mothership operations, accounting for an estimated 74% of their catch. Displaced from the CVOA, these operations will likely move into other areas, with possible increased economic and social costs.

It has been suggested that offshore mothership operations will simply move into the inshore sector by anchoring up within the baseline. For operations which depend on former JV catcher vessels this may be impossible due to the lack of RSW hold space.

2.3.3.2.3 Inshore Mothership Operations

Inshore mothership operations will presumably benefit from the CVOA, to the extent that the catcher vessels for these operations utilize the operational zone, and these operations would receive protection from the competitive threat posed by the offshore fleet. In 1991, approximately 94% of inshore mothership pollock deliveries came from within the CVOA. Inshore mothership operations which may choose to locate in areas outside the CVOA, in the St. Matthews Islands or Atka for example, may be negatively impacted if the offshore sector increases their operations in those vicinities because of implementation of the CVOA.

Other effects of the CVOA on inshore mothership operations will be similar to those experienced by the shore based processing plants in section 2.3.3.2.5 which follows.

2.3.3.2.4 Shore Based Catcher Vessels

The effects of the CVOA on shored based catcher vessels are likely to be positive. Gone is the threat, perceived or real, that the offshore sector will harvest all available pollock near the shore based plants, then move on to other aggregations of pollock. Gone also is the possibility of large catcher/processors and smaller catcher vessels competing for space to trawl. Also eliminated from the area are at-sea delivery vessels which also compete for fishing grounds. It should be noted that shore based catcher vessels are not limited to fish within the CVOA, and therefore will not be forced to change their behavior in any foreseeable manner.

If the implementation of the CVOA is accompanied by an allocation to the inshore sector, then it is likely that the entire inshore harvest could come from within the CVOA, given reduced competition from the offshore fleet. This would mean lower costs for these harvesting vessels, and, possibly higher profits. If the CVOA were implemented, even in the absence of an inshore-offshore split of the pollock TAC, the operational zone would benefit shore based catcher vessels, virtually guaranteeing them access to a sufficiently large biomass of pollock from which to harvest.

If the inshore-offshore allocation went forward without the CVOA, it is likely that the shore based catcher fleet would continue to operate as they have in the past, along the technology path which has enabled shore based catcher vessels to fish farther from their plants, with increased catch capacity. This process is not without costs: private costs accruing to the vessel owner who must continue to invest to keep up with the changing nature of the fishery, and social costs incurred by the Nation as a whole as it continues to invest capital into fisheries wherein sufficient harvest capacity already exists. [NPFMC, 1992b]

2.3.3.2.5 Shore Based Processing Plants

Shore based processing plants, which are currently all located adjacent to the CVOA, will most likely benefit from the implementation of the operational zone. These processors are highly dependent on pollock caught from within the zone. The CVOA will eliminate the threat, whether perceived or real, that the offshore sector will harvest the nearby pollock aggregations then move on to other areas. This would hold whether or not there were a specific allocation to the inshore sector.

If the implementation of the CVOA is accompanied by an allocation to the inshore sector, then it is likely that the entire inshore allocation could come from within the CVOA. Because catcher vessels delivering to shore based plants might incur lower harvesting costs, it is possible that shore based processors might negotiate lower ex-vessel purchase prices, thereby cutting there own costs as well.

If there were an inshore allocation without the CVOA, there is the possibility that the inshore sector would not be able to harvest their entire allocation without extra costs incurred because vessel must range farther to find available pollock. To the extent that catcher vessels are willing to incur any additional costs and still provide raw product to the shore based processors, then there may be no extra costs to these processors, unless they have to increase ex-vessel prices in order to entice vessels to deliver fish.

If the CVOA were implemented even without an inshore-offshore allocation, the operational zone would still benefit shore based processors. Given that offshore catcher/processors would no longer be able to fish in the CVOA, the inshore harvesting sector, could presumably deliver as much pollock to shore based processors as needed, before the entire TAC was taken if the processors offered high enough ex-vessel prices. Of course this indicates an increase in the "race for fish," which will continue to be the case, until a rational system for managing the fisheries is implemented.

2.3.4 Analysis of the Preferred Alternative

Chapter 8 of the Supplemental Analysis provided a description and rationale for the Council's Preferred Alternative, which represented a compromise between the two primary alternatives described above. The Council's Preferred Alternative was an allocation of 35/65 in the first year of the program, followed by an allocation of 37.5/62.5 (inshore-offshore) in the second and third years of the program. This alternative included designation of a CVOA and was passed by the Council by a vote of 10-1.

Although the Council was still uneasy about the cost-benefit results contained in the analyses to date, they modified the allocation percentages to mitigate perceived economic losses, and identified substantial countervailing benefits, as requested by the SOC in the earlier disapproval letter. Prior to forwarding their Preferred Alternative to the SOC, the Council performed additional cost-benefit analysis of the specific alternative recommended. The results of that analysis are summarized in Table 2.4 below:

Table 2.4 Summary Net Producer Surplus Estimates, Plants and Vessels Only, by Data Scenario; Preferred Alternative Allocation

Data Scenario	Allocation				
	A	B	C	D	E
	1993	1994	1995	NPV	NPV
	35/65	37.5/62.5	37.5/62.5	Total	U.S.
NMFS/Team					
Inshore	$32.0	$42.0	$42.0	$104.8	$50.9
Offshore	($42.3)	($55.4)	($55.4)	($138.5)	($103.9)
Net	($10.3)	($13.5)	($13.5)	($33.6)	($53.0)
Industry					
Inshore	$35.9	$47.5	$47.5	$118.4	$55.1
Offshore	($47.3)	($62.6)	($62.6)	($156.0)	($117.0)
Net	($11.4)	($15.1)	($15.1)	($37.6)	($61.9)

These results show that the modeled loss to the nation is $33.6 to $37.6 million over the three year period, down from the losses projected under the three year phase-in alternative (35/65, 40/60, 45/55), but still higher than the projections under the 30/70 split. Column E in the Table represents estimates which include projections of "leakage" of net benefits to foreign entities. In this sense, the Preferred Alternative was seen as a compromise between the various alternatives and an effort by the Council to decrease perceived costs to the nation and real costs to the offshore component of the industry, but still address the preemption problem. Sensitivity testing of the model parameters described below will show that there is uncertainty over whether there will actually be a net loss to the nation under this alternative—in fact, depending on the parameters chosen for the model, a net gain in benefits is possible.

It is intuitive that if some parameters are changed, that the overall economic effects will be altered; for example, if offshore prices and PRRs go up, then the projected net losses will increase. Conversely, if the inshore prices and PRRs go up, the projected net losses will decrease. Adjustment of the parameters, based on information from industry and NMFS data, as well as correcting documented errors in the original analyses was done in three areas: (1) offshore surimi PRRs were reduced from 17.7% to 14.0%, (2) inshore and offshore ancillary roe production rates were equalized at 1.52%, and (3) offshore variable costs were calculated directly from the OMB survey information. Under these assumptions, the model projects a net benefit of the proposed allocation of $11.6 million, prior to accounting for foreign "leakage."

Similar adjustments based on public testimony were made to the distributional impacts analyses with similar results. In this case, positive income to the inshore sector accrued at a greater rate than the offsetting negative income to the offshore sector, such that the cumulative total was also projected at $11.6 million.

Social Considerations[9]

The social impact analysis in the original study of Amendment 18/23, and as augmented in the Supplemental Analysis, concluded there would be positive social gains from an inshore allocation of pollock, and that social benefits to inshore operations may arise from increased or stabilized incomes, employment, and related economic activity, and simply from reductions in the uncertainty, or threat of preemption that accompanies a set allocation. Only in the short term, and in extreme situations where substantial allocations of TAC are made to the inshore sector, would community infrastructure be incapable of accommodating the pressure on social services.

In developing its preferred alternative for resubmission to the Secretary, the Council heard considerable public testimony from industry and related interests on the potential social impacts of the proposed allocations. Representatives of communities from Western Alaska testified on the benefits that would be generated from an inshore allocation. An inshore allocation would stabilize municipal and community revenues to finance schools, water, sewer and solid waste facilities, ports and harbors, and medical facilities, especially in light of declining oil-based revenues. The inshore pollock industry in 1992 alone generated about $7 million in municipal, borough, and state taxes, all important to regional developments and infrastructure. For example, the City of Unalaska generates $14 million in general fund revenues annually, and fisheries taxes or related property taxes provide 52% of that revenue base. In the Aleutians East Borough in FY 1991, groundfish processing in Akutan provided $1,072,632 or 37% of the Borough's total sales/use tax revenues. The proceeds helped fund medical, education, and capital projects throughout the Borough in Cold Bay, King Cove, Nelson Lagoon, and Sand Point. Deliveries and processing at Akutan support a year round work force and provided funds for improving docks, warehouses, and air service. In the Pribilofs, inshore processing of crab now provides 24-26% of the total revenues in St. George, and more processing opportunity would greatly improve the economy, especially since fur seals can no longer be harvested. St. Paul testified that CDQs will not be sufficient, and that more processing and involvement in the industry are needed to increase their economic well-being.

Overall, both the inshore and offshore sectors contribute to the economies of Western Alaska. But the preponderance of testimony by representatives of local communities indicated that they supported a continued inshore-offshore allocation because it would clearly benefit Alaska coastal communities in the short term and

[9]This sections and the next (Conclusions of the Supplementary Analysis) are excerpted directly from the "Supplementary Analysis" dated September 3, 1992.

would provide community stability in the long-term. There would be a more stable flow of municipal and state revenues, as opposed to the current economic peaks and valleys, and locally managed and owned support businesses would operate evenly throughout the year to serve processors, their workers, and their fleets. An expanded market would be available to fishermen for processing traditional species. There would be continued integration and permanent residency of processing and management personnel and their families. Employment opportunities for local residents would continue to improve. Longer-term decision-making and planning would occur which would facilitate financing of sorely-needed infrastructure.

The Council recognizes that there will be losses to the offshore industry as a result of the preferred alternative allocations. For example, one factory trawler representative testified that his company would have to reduce full-time employment by about 50 people out of 141 as a result of the allocation. These and other employment changes likely will occur in the offshore sector. However, the Council believes that these losses will be more easily absorbed in the greater Seattle economy than losses that may be imposed on the local Alaska inshore sector economies if the preemption problem is not addressed. To illustrate, the offshore sector employs about 0.3 percent of the Seattle workforce, if it is assumed that all employees come from that area. In contrast, the seafood processing industry is about 49% of total employment and 65% of private employment in the Aleutians area. In the greater Seattle area, that would be equivalent to 555,000 people directly employed in seafood processing, which is equivalent to nearly five times the total Washington statewide employment in the aircraft industry. The seafood processing industry thus is nearly five times as important to the Aleutians area as the aircraft industry is to the greater Seattle area of King and Snohomish Counties.

Conclusions of Supplementary Analysis

Both inshore and offshore sectors of the groundfish industry have experienced explosive growth in the last few years, and the preferred alternative is an interim measure to manage the allocation conflicts and sectoral preemption problems that have developed between the domestic inshore and offshore components of the pollock fishery in the BSAI. As stressed in the original SEIS, the situation and problem are rooted in an overcapitalization dilemma for which there is no apparent simple solution. The absence of recognizable property or access rights in the affected fishery, fueled by conditions of open access under the Olympic system have created conditions of excess capacity that have now spilled over into serious allocation conflicts among the various catching and processing interests. This situation threatens to evolve into a destructively competitive environment that could jeopardize the economic and biological stability of the fishery resources involved.

The revised alternatives considered by the Council offered a condensed range of options, based on issues raised by the Commerce Department in their partial approval of Amendment 18 in March 1992. The Council's preferred alternative is a variation of the basic plan originally adopted in June 1991; separate allocations of the pollock TAC to defined inshore and offshore components, combined with a designated operational area around the inshore processing ports at Dutch Harbor and Akutan. This action creates separate catch quotas for the two components, as well as partially separate operational areas. The preferred alternative is intended to provide a more stabilized operating environment conducive to community and economic development, as well as prevent a further deterioration of the working and competitive relationships that exist within the industry.

The supplementary analysis, along with public comment submitted to the Council, documents that operating stability and preemptive relief granted to the inshore sector comes at a direct cost to the offshore sector. As a result, the Council has sought to weigh the various dimensions of inshore gains against resulting offshore losses that might arise through corrective management action. The supplementary analysis provides a systematic examination of costs, benefits, and related economic impacts projected to occur under the allocation alternative, compared to the status quo. The data and model parameters employed in the estimation procedure show that a preferential allocation to the inshore sector is likely to impose a net national economic cost. However, the magnitude and probability of economic benefits and costs remain the subject of great controversy. A relatively small change in some of the key inputs to the benefit-cost model can cause major differences in the estimates of net national loss or benefit. The analysis has illustrated those dimensions of the industry that determine relative economic efficiency and equity, and the associated variables that might be monitored in ongoing or future analyses of economic performance.

There are national benefits associated with maintaining a balance in the social and economic opportunities inherent in these fisheries. Restricting or managing preemption helps ensure that the fishery resources are available to provide benefits to all parties, without unduly obstructing the competitive element of the marketplace. The assignment of set harvest shares of allocations is expected to reduce the uncertainty and operational instability caused by actual or threatened preemption.

Social impact considerations indicate that only in the short-term and in extreme situations where substantial allocations of TAC are made to the inshore sector, would community infrastructure be incapable of accommodating the pressure on social services. In most cases, Alaska communities would welcome the economic input into their area associated with a preferential inshore allocation. An increase in Alaska employment would effect a proportionally larger decrease in employment in the Pacific Northwest due to a lower cost of living and lower wages in Washington and Oregon, relative to Alaska. However, there is evidence that the Pacific Northwest communities can more easily absorb this loss of employment into other industries.

The allocation percentages developed in the preferred alternative represent the balance or compromise between the inshore and offshore sectors intended to achieve an equitable apportionment of the pollock resource without needlessly penalizing the equity or efficiency of either component. The sector allocations are not expected to result in permanent solutions to the preemption problem, and are likely to be eroded over time by subsequent preemption within the respective sectors. The vessel moratorium amendment proposed by the Council may slow this process, or prevent a worsening of the overcapitalization problem, but the pollock catching and processing industry already has excess capacity, so competitive pressures are expected to resurface. The preferred alternative represents an interim management action to prevent a worsening of the situation while a comprehensive solution to the overcapitalization problem and related allocation conflicts is being developed.

In summary, the Council believes it is to the benefit of the nation to address the preemption problem by allocating between the competing sectors. The adjustments in the pollock available to the two sectors will provide a suitable harvest resource base for each sector over the next three years while the Council develops a comprehensive plan to rationalize the fisheries, equitably and responsibly. While developing the plan, a major social consideration of the Council is that there needs to be stability and protection of local communities and smaller fishing operations in the face of a highly mobile preemptive fleet. Having considered the analysis and supporting information, and extensive public testimony on both sides of the issue, the Council believes this allocation plan is in the best interest of the United States.

2.4 ANALYTICAL APPROACH FOR CURRENT ANALYSIS

This section of the document describes for the reviewer the basic methodological approach to the current analysis, and some of the key issues, indices, and terminology which will be examined. This analysis does not directly attempt to respade previous economic analyses from 1990 through 1992, nor does it attempt to provide any direct, quantitative reassessments of costs and benefits attributable to the inshore-offshore allocation. The results of previous analyses, as described in Section 2.0, show that the overall net economic effects of the allocation range widely across the spectrum from significant net losses to moderate gains, depending upon the parameters and assumptions used in the detailed economic models which were employed. Changes in these parameters and assumptions since 1990 are identified where information is available, and the general, directional implications of those changes are discussed. Wholesale reassessment would not be expected to significantly change the basic findings of the original analyses, nor would such reassessment be necessarily useful to the decision facing the Council in 1995.

Much of the rationale for the Council's original approval of Amendment 18/23 centered around distributional benefits, socio-economic implications, and the *differential* impacts of the allocation to each industry sector. Overall cost/benefit findings were only part of the information relevant to the issue, and these findings are not expected to differ significantly from the original analyses, nor is the ability to accurately predict overall net benefits any better than it was previously. In fact, such predictions could be more difficult under this proposal because analysts would also be faced with having to predict distributions of processing activity in the absence of the allocation.

The current situation facing the Council, as well as the analysts on this project, is quite different today than it was in 1990. The inshore-offshore allocation and the pollock CDQ program have been in place for three years, creating a different set of operating parameters for the industry overall. The maintenance of stability in the industry, while pursuing development of the CRP initiative, is a key factor in the decision for reauthorization and thus is a key factor in any analysis of that reauthorization. The general approach of this analysis is to address the issue of net benefits by incorporating by reference the findings from the Supplemental Analysis dated September 3, 1992. As noted above, that analysis identified a range of net benefit assessments depending on the parameters and assumptions used for each sector. This analysis examines some of those parameters and assumptions and provides general, qualitative assessments as to the likely outcome under today's fishery conditions. A primary focus of the analysis is on the issue of how the two alternatives under consideration will affect each industry sector *from the perspective of the current situation each is experiencing in the fisheries; i.e., the base case, which is defined as the state of operations in 1993 and 1994.* The issue of sector and overall industry stability has been identified as being of primary concern relative to the alternatives under consideration. The overall approach of this analysis, which is more qualitative than quantitative in nature, has been reviewed and endorsed by the Council's industry Advisory Panel, the Council's Scientific and Statistical Committee, and the Council itself. Following sections provide additional detail on the overall approach and on specific aspects of the analysis.

2.4.1 Definition of the Base Case

The reference point for comparison of the alternatives will be the "base case": i.e., the EEZ pollock and GOA Pacific cod fisheries as they exist under current regulations, in particular the most recent years for which we have adequate data. The "base case" includes both the marine and fishery indices and economic and social indices. These are detailed in Chapters 3 and 4, respectively. This approach to the analysis makes no assumptions regarding which alternative is the "status quo." Technically, the status quo is defined as the set of regulations currently in place, or that which would be in place under the No Action alternative. This definition would indicate that the status quo includes expiration of Amendment 18/23. However, the definition of status quo in this case is functionally one of perspective of the decision makers. The analysis assumes neither perspective and simply makes projections of impacts, for each alternative, based on a comparison to the "base case." Impacts to each sector studied are assessed relative to what is occurring in the fisheries currently, with the inshore-offshore allocation and pollock CDQ program in place.

2.4.2 Projections of Outcomes Under the Alternatives

Chapters 5 and 6 contain projections of what will occur under each of the alternatives—No Action or reauthorization of Amendment 18/23, respectively. Using the information on the "base case" as defined in Chapters 3 and 4 as a reference point, projections are provided relative to the future ABCs and TACs, harvest by sector, and seasonality and location of deliveries and processing. Factors influencing these projections include historical production by sector, average daily production by sector as found in the "base case," and the projections of available TACs. In addition to these basic fishery oriented projections, the analysis also attempts to provide projections on stability indices, consumer and producer surplus indices, distributional indices, and impacts to affected communities. In regard to affected communities, the analysis focuses only on the primary communities as identified in the original analysis—Kodiak, Sand Point, St. Paul, Unalaska, Bellingham, and Newport.

Essentially, this section of the document attempts to paint a picture of what the fisheries and affected sector will look like with and without amendment 18/23 in place. CDQ communities are discussed separately in Chapter 9.

2.4.3 Comparison of the Base Case to the Projected Alternative Outcomes

After defining the projected outcomes under either of the alternatives, the next step is to assess the types and magnitudes of change expected relative to the "base case," and to assess what impact those changes have on the sectors identified, as well as the overall industry. In evaluating the projected changes under either alternative, the analysis focuses on the primary industry sectors and communities identified above. Projected changes will be evaluated relative to the Council's current Problem Statement. For example, projected changes in outcomes and indices will be used to discuss the ability of each alternative to maintain stability in the fisheries, and future tradeoffs between industry sectors will be estimated based on these projections. As discussed earlier, the analysis does not attempt to wholly reassess net benefit projections; rather, primary parameters used in earlier modeling exercises will be evaluated, and where significant changes in these parameters are expected, the analysis predicts potential outcomes in a qualitative manner.

2.4.4 Key Issues to be Examined

In building the "base case" descriptions of the fisheries and industry sectors, as well as in the comparisons and projected impacts sections, several primary indices will be utilized. We summarize and define these in the following sections to set the stage for the remainder of the analysis.

2.4.4.1 Marine and Fishery Indices

We define marine and fishery indices, i.e., the "marine environment," to include the harvest of pollock and Pacific cod and examine the impacts of those removals on the pollock and Pacific cod stocks as well as impacts of the fisheries on other stocks of marine organisms including other exploited and non-exploited fish stocks, marine mammals, and seabirds. The analysis will examine the natural history of the eastern Bering Sea pollock stock and a recent history of stock assessments. There will also be an examination of the size and biomass distribution, and analysis CPUEs of pollock and bycatch of PSC in the CVOA. Included in the study of the CVOA will be a summary of Marine Mammal impacts.

2.4.4.2 Economic and Social Indices

In defining the economic and social indices, the analysis attempts to paint a picture of what is happening in the fisheries currently, and then compare these indices to what is projected to occur with and without Amendment 18/23 in place. In this examination, the starting place is also the point of harvest. The document examines the harvesters in detail as well as the processors, affected communities, and markets (i.e., the end consumers). The following major indices will be utilized in the analysis.

<u>Stability</u>

Stability has been highlighted in the problem statement as a primary consideration for the proposed reauthorization of Amendment 18/23. Unfortunately, stability by its very nature is a difficult concept to study and quantify. For purposes of this study, we will define stability as a state of being which is "not likely to breakdown, fall apart, or give way." The inshore-offshore allocation inherently provides the inshore and offshore sectors access to specified percentages of the pollock and Pacific cod resources. The set harvest percentage may add to the stability of the relationship between the inshore and offshore sectors. Similarly, the allocation may provide stability within the sectors. The definition of stability given above allows us to develop indicators of stability within sectors. These indicators or measures differ depending on the entity in question. Stable communities are characterized by relatively constant populations and economic activity. They will also be communities in which the necessary infrastructures are in place and are utilized at a reasonable level. Communities with boom and bust economies are inherently unstable as are communities with insufficient infrastructures or infrastructures that are unwarranted. Diversity is another characteristic of stable businesses, economies and communities, and will be used as an index of stability. Stability from the perspective of a given business will be quite different. Here the focus will be on markets and access to the means of production. Stable businesses will face a relatively steady demand for the products they produce, and will be able to obtain the necessary inputs for their production. They will also be able to achieve a reasonable utilization of their production capacity. In general then, the following may be used to measure stability for this analysis depending on the availability of data.

Infrastructure Levels and Utilization

Infrastructure is defined in terms of communal assets, i.e., roads, schools, ports, etc., which enable communities to engage in economic and social activity. The availability of data on community infrastructure is limited, but is relevant where available, particularly with respect to recent changes in infrastructure. Infrastructure and capacity utilization (capacity is defined below) are direct indicators of stability as we have defined the term above. Utilization is directly related to level or amount of infrastructure or capacity in place and available for use. If infrastructure and capacity exceed utilization then the entity is less stable, particularly if the utilization is insufficient to support and pay for its own maintenance. Similarly, if utilization is excessive then the entity is prone to instability, particularly if additional infrastructure or capacity is unattainable. In many cases, over-utilization will lead to growth and to additional infrastructure and capacity, which may return the entity to a more stable but different position.

Processing Capacity and Utilization

Capacity is defined differently for different sectors of the industry, particularly the harvesting and processing sectors. Processing capacity will be defined primarily on the basis of historical production, modified by any currently available information. If a processor produced a product during the base case, then the capacity to produce that product will be a function of the maximum rate of production achieved at any time during the base case. This measure of capacity may be augmented if additional data indicating that new machinery has been installed are available. Capacity utilization may be measured as a ratio of capacity to actual production. If capacity utilization is very low, or projected to decrease, then it is likely that the costs of maintaining that capacity are not being met and the business or industry sector is less stable.

Access to Resources and Production Inputs

Stable industries cannot be developed in the absence of consistent access to resources and production inputs. The inshore-offshore allocation may provide consistent percentages to industry sectors as a whole, but within each sector access to fish resources may not be assured. Availability of other production inputs, such as fuel and employees, will also be examined where data exist.

Producer Surplus Measures, Costs and Revenues

Producer surplus is a measure of efficiency generally associated with cost/benefit analysis. An explicit calculation of producer surplus was undertaken in the original analysis. Because the cost data used in the original study have not been updated there will not be an explicit estimate of producer surplus in this analysis. Rather this study examines any relevant directional changes of the parameters used in the original analysis, and attempts in a more qualitative sense to determine any changes which could be expected.

The supplemental analysis estimated net benefits from the industry by estimating net revenue per ton of pollock for each sector using linear cost and revenue functions. The total inshore net revenue was estimated by multiplying the total tons of pollock allocated to the inshore sector under a given alternative by the estimated net revenue per ton. The total offshore net revenue was estimated by multiplying the total tons allocated to the sector under a given alternative by the estimated net revenue per ton. The offshore total net revenue was then added to the inshore total net revenue to calculate overall total net revenue for the alternative. Finally total net revenues for various alternative were compared to the total net revenue estimated by a similar method for the base case. If total estimated net revenues under the base case were greater than total net revenues of the alternative, then a the analysis predicted a overall loss of benefits to the nation from the pollock fishery. The various ranges of estimates depicted in the supplemental result from a "Monte Carlo" procedure whereby 1000 different sets of possible parameters are randomly selected and input into the cost and revenue functions.

In the current analysis we examine the various parameters which go into the revenue functions for the two sectors. No new cost information has been obtained since the OMB survey undertaken in 1990, and therefore we do not examine parameters in the cost function, and by default assume in fact that per ton cost have remained constant compared to estimates in the supplemental analysis. Given the assumption that costs are unchanged, then it is possible to provide directional estimates of overall net benefits by examining directional changes of parameters in the revenue functions. For example, if revenue for the offshore sector were estimated to have increased relative to revenue estimates used in the supplemental analysis, then the offshore net revenue (revenue - cost) would have increased. At the same time if revenue for the inshore sector also increased relative to the estimate in the supplemental analysis, and that increase was a larger relative increase than the increase estimated in the offshore sector, then we would be able to state that the overall net revenues to the pollock industry increased, always bearing in mind that no new cost information is available. To reiterate, we are not attempting to predict a new point estimate, rather to provide projections of the likely direction that point estimate has moved given revenue data from the fishery since 1992.

Markets

Markets impact stability by creating demand for products. If markets fluctuate wildly then industry sectors using that market will be less stable. Additionally, the influence of the inshore-offshore allocation on markets and on market control has been cited as an important area of study.

Products and Production Levels

The product mix of the inshore and offshore sectors may differ, and therefore, the inshore-offshore allocation may directly or indirectly impact the market for these products. Supply shocks may impact the market and prices which may lead to instability, and may have distribution and efficiency implications.

Future Tradeoffs Between Impacted Sectors: Distributional Impacts

The problem statement also focuses on future tradeoffs between all impacted sectors. From the analytical perspective, this is interpreted to be the distributional impacts of the two alternatives; who gains and who loses if the pie is sliced differently. Policy implications of a given choice (to reauthorize Amendment 18/23 or not) are not addressed in this analysis, other than the extent to which the decision may affect further development of the overall CRP process.

3 BASE CASE DESCRIPTION OF THE FISHERIES, CPUE, BYCATCH, AND CVOA ACTIVITIES

3.1 EASTERN BERING SEA POLLOCK NATURAL HISTORY AND RECENT STOCK ASSESSMENTS

Walleye pollock (*Theragra chalcogramma*) is one of the most abundant fish species in the Bering Sea and supports one of the largest fisheries in the world (total Bering Sea pollock landings have ranged from 1.7 - 4.1 million mt including U.S., Soviet, Japanese, and Donut Hole catch from 1988-94; Wespestad, pers. comm.). In addition, it is a very important forage fish for marine mammals, birds, as well as many fish, some of which are themselves commercially exploited. Pollock primarily inhabit waters over the outer continental shelf and slope (down to 500 m), but also live pelagically over deep waters in the central Bering Sea and the Aleutian Basin. As pollock age, they tend to become increasingly demersal. Juvenile pollock (ages 0–2) are more often found in pelagic schools, while older, mature pollock live closer to the bottom. Pollock can be considered an r–selected species, since it has life history characteristics which enable it to quickly respond to favorable environmental conditions (through increases in recruitment). Pollock have high fecundity (millions of eggs per female), have relatively short life spans (most live less than 15 years), and grow and become sexually mature quickly (>50% of L_∞ and sexually mature by ages 3–4) (Wespestad 1994). These life history characteristics can contribute to instability in the population size from year–to–year (which is typical of gadids) and to uncertainties in the ability to predict the size of incoming year–classes and future population sizes.

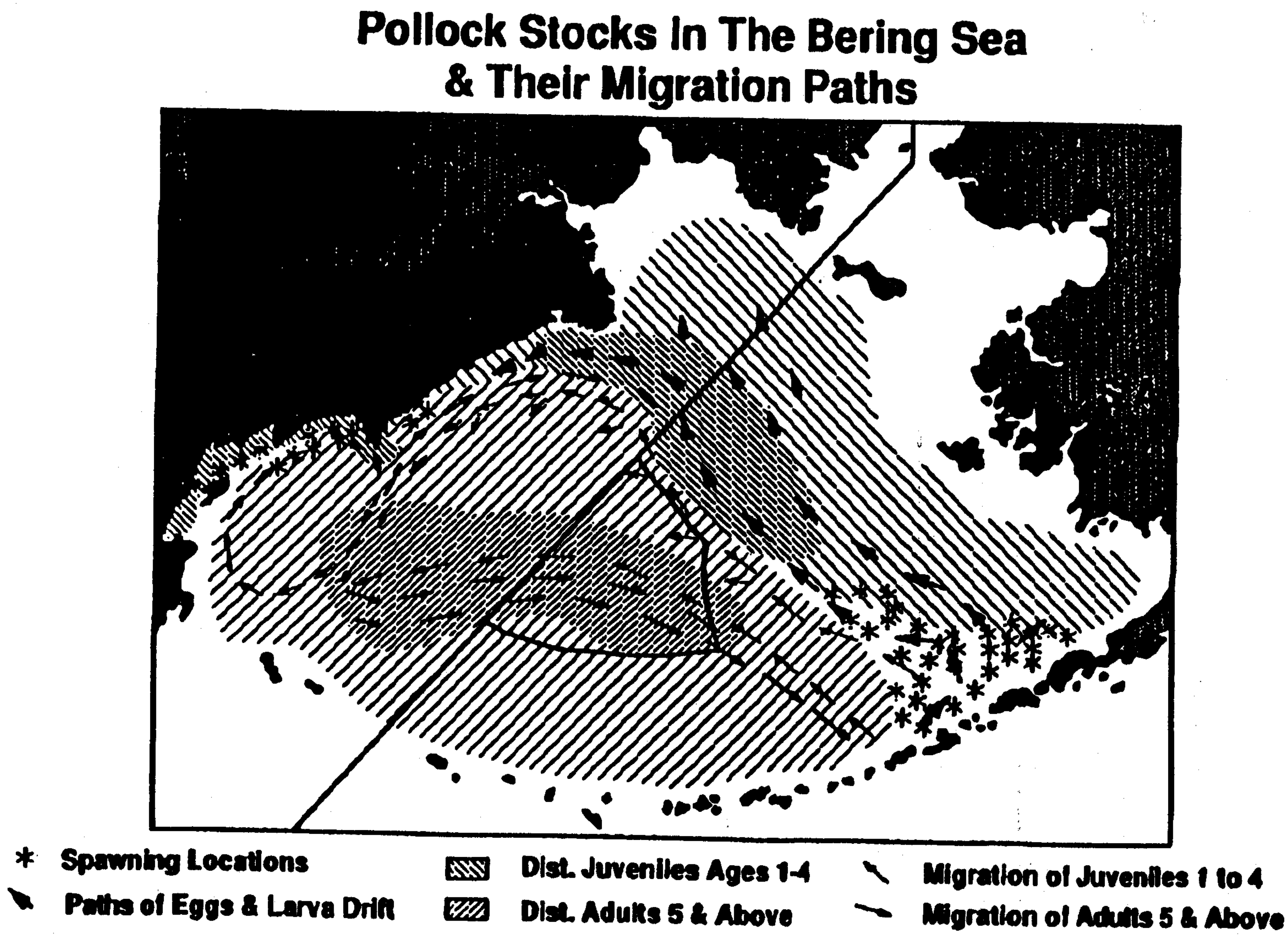
3.1.1 Reproduction and Stocks in the EBS

Pollock undergo seasonal and diurnal migrations associated with spawning and feeding. While spawning can occur intermittently throughout the year, most spawning in the Bering Sea occurs from late winter through spring (February–June), and varies depending on location. There are at least two major spawning stocks of pollock in the Bering Sea, one on the relatively narrow western shelf off Russia, and a much larger one on and near the wider eastern shelf off Alaska (Figure 3.1). Spawning usually begins in late February on the southeastern continental slope (the Bogoslof district, NPFMC statistical area 518), and progresses onto the shelf north of Unimak Island. The amount of spawning usually declines and occurs later to the northwest (near the Pribilof Islands and as far north as St. Matthew Island). Pollock on the western shelf usually spawn in April through June. During spawning, pollock aggregate in large assemblages which are particularly susceptible to fisheries which target roe–bearing females (eastern Bering Sea "A" season).

Pollock spawn planktonic eggs (fertilization and development are external) that require approximately 2–3 weeks to hatch. Larvae from the eastern Bering Sea (EBS) shelf spawning aggregation generally drift to the northwest due to the prevailing currents where development progresses. Typically, bottom trawl and hydroacoustic surveys of pollock on the eastern shelf and slope find many more 1–2 year old pollock northwest of the Pribilof Islands than on the southeastern shelf. Furthermore, recent catches of pollock by Russian fisheries on the northern shelf near Cape Navarin and in the Gulf of Anadyr were predominately 2–3 year–old fish from strong EBS year-classes, and not members of strong western Bering Sea cohorts (V. Wespestad, pers. comm.). As pollock become mature in the EBS, they generally return to the southeastern Bering Sea to spawn. Some members of large EBS year-classes apparently remain in the Aleutian Basin.

It is unclear how much the spawning over deep slope waters in the Bogoslof district contributes to recruitment to the eastern Bering Sea shelf population (Wespestad, 1994). Spawning fish in the Bogoslof district are composed of pollock from the Aleutian Basin "stock," which may be primarily density–dependent "overflow" from the eastern shelf population. Since little spawning occurs and very few small pollock are found in the central Aleutian Basin, it is not clear that the Basin stock is self–sustaining. Furthermore, the relationship between the large spawning aggregations in the Bogoslof district and recruitment to the shelf population is not known. It is difficult to imagine, however, that such a large population of pollock existing pelagically in Basin waters and

Figure 3-1. Major spawning aggregations, migration routes and distributions of adult and juvenile walleye pollock in the Bering Sea according to N. Fadayev.



Source: "The Walleye Pollock Migration in the Bering Sea" By N. Fadeyev spawning in great numbers near the EBS shelf contributed little if any larval recruits to both itself and the EBS shelf population.

3.1.2 Pollock Diet

As pollock age and grow, the percentage of their diet composed of planktonic organisms decreases, while proportions of shrimp and fish increase. Larval pollock feed primarily on copepod eggs and nauplii after their yolk reserves have been exhausted, while juveniles prey on larger copepods, euphausiids, and amphipods. Pollock year–class strength may depend to some degree on the availability of planktonic prey during critical periods in the larval phase, particularly shortly after the yolk is depleted. Adult pollock feed on shrimp, euphausiids and various fish, including sand lance, juvenile pollock, capelin and herring; adults also undergo diurnal movements related to feeding, tending to aggregate near the bottom during the day, and rising at night to feed. Cannibalism by adult pollock may be a significant source of mortality of age–0 pollock in the EBS, and may affect cohort strength (Livingston 1993). Consequently, in the EBS, both density–independent (largely oceanographic and environmental) and density–dependent (size of adult pollock population) factors affect pollock cohort size.

3.1.3 Recent Population Dynamics, Fishery Catches and Predictions

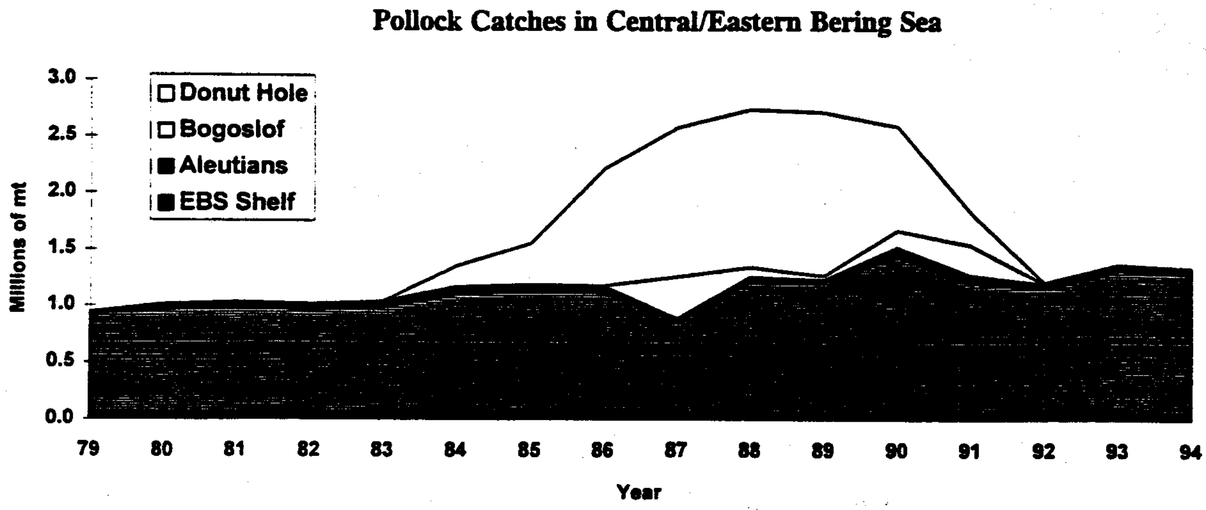
Since the late 1970s, the pollock population in the EBS has been dominated by four year– classes spawned in 1978, 1982, 1984 and 1989 (Figure 3.2). The 1978 year-class was the largest known pollock year-class in the EBS (since the mid 1960s), and was chiefly responsible for the increase in age 3+ (exploitable) EBS pollock biomass from about 6 million mt in 1979 to over 14 million mt in 1985 (Figure 3.2). Since 1985, and the passage of the 1978, 1982 and 1984 year-classes through the population, age 3+ EBS pollock biomass declined to between 7–8 million mt through 1995. Current (1995) exploitable biomass is estimated at 8.082 million mt. The period from 1990-93 was a period of transition for the pollock population, from an older one composed primarily of the 1978, 1982 and 1984 year-classes, to a younger one dominated by the year-class spawned in 1989.

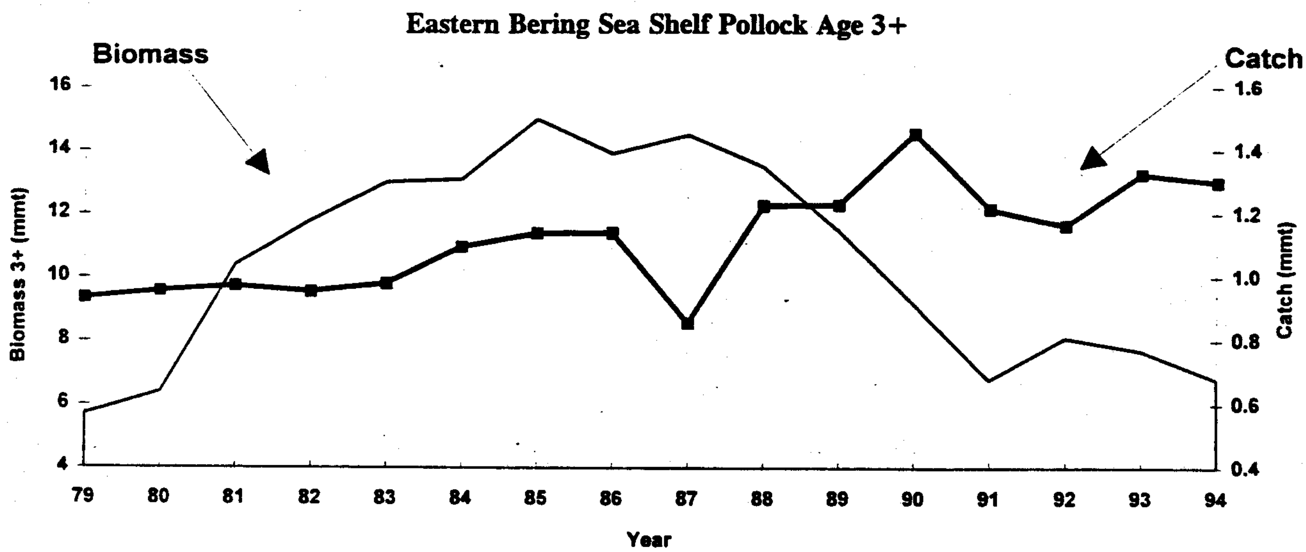
Since 1979, the total catch of pollock from the EBS increased from about 0.9 million mt to about 1.3 million mt in 1994. During this period, harvest rates (catch divided by exploitable biomass) of EBS pollock were slightly greater than 10% in 1979-80, 10% or less from 1981–1989, and 17% in the early 1990s (Figure 3.2; Wespestad 1994).

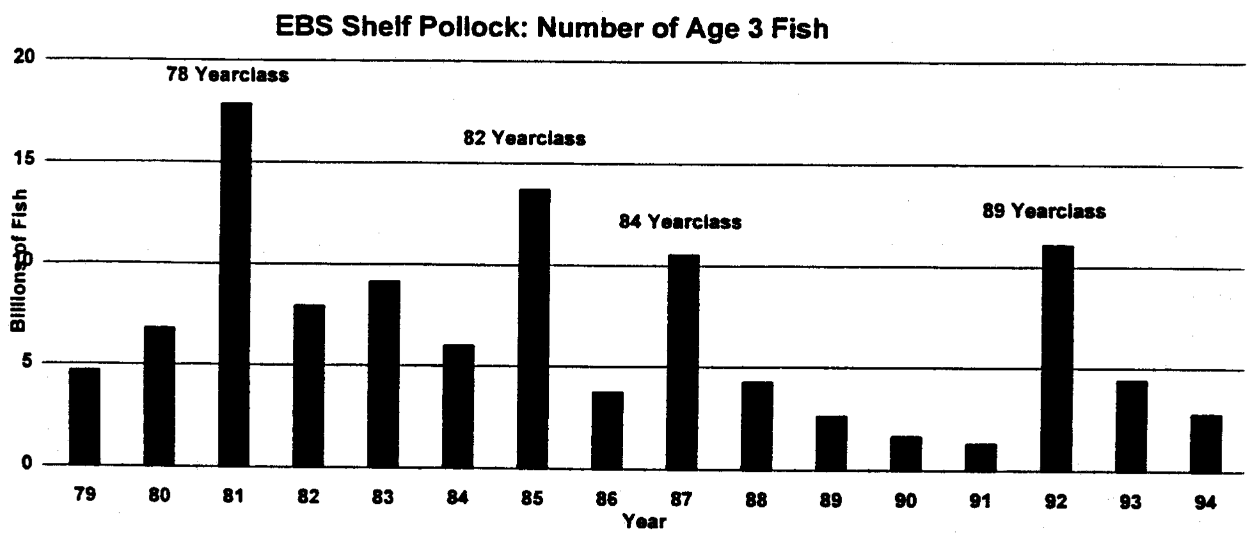
Wespestad (1994) projected age 3+ EBS pollock biomass and catches into the near future (1996–1998). These estimates utilized the age distribution and biomass as assessed for 1995 and age 3 recruitment from both (1) the relationship between age 1 abundance in the annual EBS bottom trawl survey and age 3 cohort size from the population model and (2) the spawner–recruit relationship. Based on his projections, which include a prediction of a relatively large 1992 year-class (observed in the hydroacoustic survey of the shelf in summer 1994), exploitable biomass will either increase or decrease slightly through 1998 depending on the fishing exploitation strategy employed. Fishing at an $F_{0.1}$ rate, age 3+ biomass should increase slightly from 8.082 million mt in 1995 to 8.236 million mt in 1998, with yields of 1.267, 1.298, and 1.313 million mt in 1996–98 respectively. An $F_{0.1}$ strategy was chosen for the 1995 EBS pollock fishery, and the TAC was set at 1.250 million mt. If fishing mortality is set using an $F_{35\%}$ rate in 1996–98, exploitable biomass could decrease slightly from 8.082 million mt in 1995 to about 7.8 million mt in 1998, with annual catches of between 1.4 and 1.5 million mt.

Aleutian Basin pollock were harvested in international waters of the central Bering Sea (known as the donut hole) from 1984–1992. Pollock that spawn in the Bogoslof district in the southeastern Bering Sea are thought to be part of the central Bering Sea "stock." Catches of Aleutian Basin pollock (donut hole plus Bogoslof) increased from 0.2 million mt in 1984 to between 1.5–1.7 million mt in 1987–89. Between 1989–1991, basin pollock catches declined from over 1 million mt to less than 0.6 million mt. This declining trend was also evidenced in

Figure 3-2. Catches, biomass and year-class strength of pollock on eastern Bering Sea shelf. Catches of pollock in Donut Hole and Bogoslof area area also shown.







the annual (since 1988), winter hydroacoustic surveys of the Bogoslof spawning population (the only survey of the basin stock conducted), which declined from 2.4 million mt in 1988 to just over 0.5 million mt in 1994. Beginning in 1991, the first in a series of international conferences between coastal (US and Russia) and fishing states (China, Japan, Korea and Poland) was held to consider arrangements for the conservation of pollock resources in the central Bering Sea. While some agreements on limiting new effort were reached, no progress was made on reaching an agreement that would severely curtail catches of basin pollock as a stock conservation measure. It was not until mid- 1992, after it became clear that the stock had been reduced to "economic extinction" (large reductions in catch–per–unit–effort by vessels from the fishing states) that all parties agreed to a suspension of fishing in the donut hole beginning in 1993. The US (NPFMC) had already closed the Bogoslof district to directed pollock fishing beginning in 1992.

3.2 POLLOCK POPULATIONS AND FISHERIES (1990-94)

3.2.1 Size and Biomass Distribution of Pollock from Surveys and Fisheries

For the purposes of analyzing survey information in this report, the eastern Bering Sea is divided into three main areas: the CVOA, located south of 56°N latitude, between 163-168°W longitude in the Bering Sea; and two areas outside the CVOA. The area outside of the CVOA was divided east and west of 170°W longitude, or the boundary of INPFC areas 51 and 52. AREA 51 contains all the area outside of the CVOA and the Bogoslof district (518) in INPFC area 51; AREA 52 is the entire INPFC area 52. These areas are shown in Figure 3.3.

3.2.2 Survey Information

NMFS conducts two types of surveys in the eastern Bering Sea during the summer months. First, bottom-trawl surveys of the southeastern shelf (to 200 m depth) south of about 61°N latitude (Figure 3.3) are conducted annually. Second, echo integration-midwater trawl (EIMWT) surveys of the same area are conducted every three years. Information on pollock size distribution from bottom trawl surveys conducted in 1990-94 and EIMWT surveys conducted in 1991 and 1994 were summarized for the southeastern Bering Sea shelf region.

Biomass Distribution. Table 3.1 shows the exploitable (30+ cm) and total pollock biomass from the bottom and EIMWT surveys conducted in 1990-94. The bottom trawl survey data and the 1994 EIMWT data were separated into the three areas shown in Figure 3.3; the 1991 EIMWT data were separable only into areas east and west of 170°W longitude (west of 170°W is equivalent to area 52; east is equivalent to area 51 and the CVOA combined). Bottom trawl exploitable pollock biomass ranged from 4.4 million to 7.0 million mt in 1990-94, while the range in total biomass was similar (4.5 million to 7.0 million mt). EIMWT exploitable biomass increased three-fold from 1991 to 1994 (0.6 to 2.1 million mt), while total biomass almost doubled in that period (1.4 to 2.4 million mt).

Figures 3.4-3.8 show the distribution of exploitable (30+ cm in length) pollock biomass based on the haul-by-haul catch-per-unit-effort from the bottom trawl surveys of 1990-94. Figure 3.9 shows the relative fish density along the survey track line of the 1994 EIMWT survey. Exploitable pollock biomass was concentrated in area 52 in the 1990 bottom trawl survey. Beginning in 1991, however, both the bottom trawl and EIMWT surveys suggest that exploitable pollock biomass shifted proportionally from area 52 to the east and south. The CVOA and area 51 combined accounted for only 24% of the exploitable bottom trawl biomass in 1990 (total of 1.7 million mt), but their combined fraction increased to between 41-63% in 1991-94 (totals ranging from 1.8-3.2 million mt). Similarly, the midwater fraction of the exploitable population also shifted to the south and east, increasing from 15% in 1991 (total of only 0.09 million mt) to 24% in 1994 (0.5 million mt) in the combined CVOA/Area 51.

Table 3-1. Total and exploitable (30+ cm) pollock biomass (mt) by area from the 1990-94 bottom and echo-integration midwater trawl (EIMWT) surveys, bottom trawl survey standard area only. 1991 EIMWT biomasses for area 51 (in bold and underlined) include the CVOA. In all other surveys, biomasses for the three areas in Figure 3-3 are separate.

		Exploitable (30+ cm)				Total			
Year	Area	Bottom	EIMWT	Combined	Percent	Bottom	EIMWT	Combined	Percent
1990	CVOA	719,319			10%	719,535			10%
	51	1,000,364			14%	1,006,996			14%
	52	5,301,877			76%	5,349,852			76%
	EBS	7,021,560				7,076,383			
1991	CVOA	863,725		863,725	16%	864,222		864,222	13%
	51	1,580,837	**94,516**	1,675,353	31%	1,594,838	**473,474**	2,068,312	32%
	52	2,419,405	532,062	2,951,467	54%	2,537,932	980,179	3,518,110	55%
	EBS	4,863,967	626,578	5,490,545		4,996,992	1,453,653	6,450,645	
1992	CVOA	304,372			7%	304,588			7%
	51	1,497,105			34%	1,505,715			34%
	52	2,621,765			59%	2,674,717			60%
	EBS	4,423,242				4,485,020			
1993	CVOA	866,955			15%	866,959			15%
	51	2,330,343			41%	2,365,175			41%
	52	2,443,531			43%	2,471,040			43%
	EBS	5,640,829				5,703,174			
1994	CVOA	1,064,040	246,307	1,310,347	19%	1,064,062	246,603	1,310,665	18%
	51	2,031,291	257,708	2,288,999	33%	2,047,588	263,215	2,310,803	31%
	52	1,847,596	1,572,044	3,419,640	49%	1,900,316	1,915,080	3,815,396	51%
	EBS	4,942,927	2,076,059	7,018,986		5,011,965	2,424,898	7,436,863	

Eastern Bering Sea Groundfish Trawl Survey Area

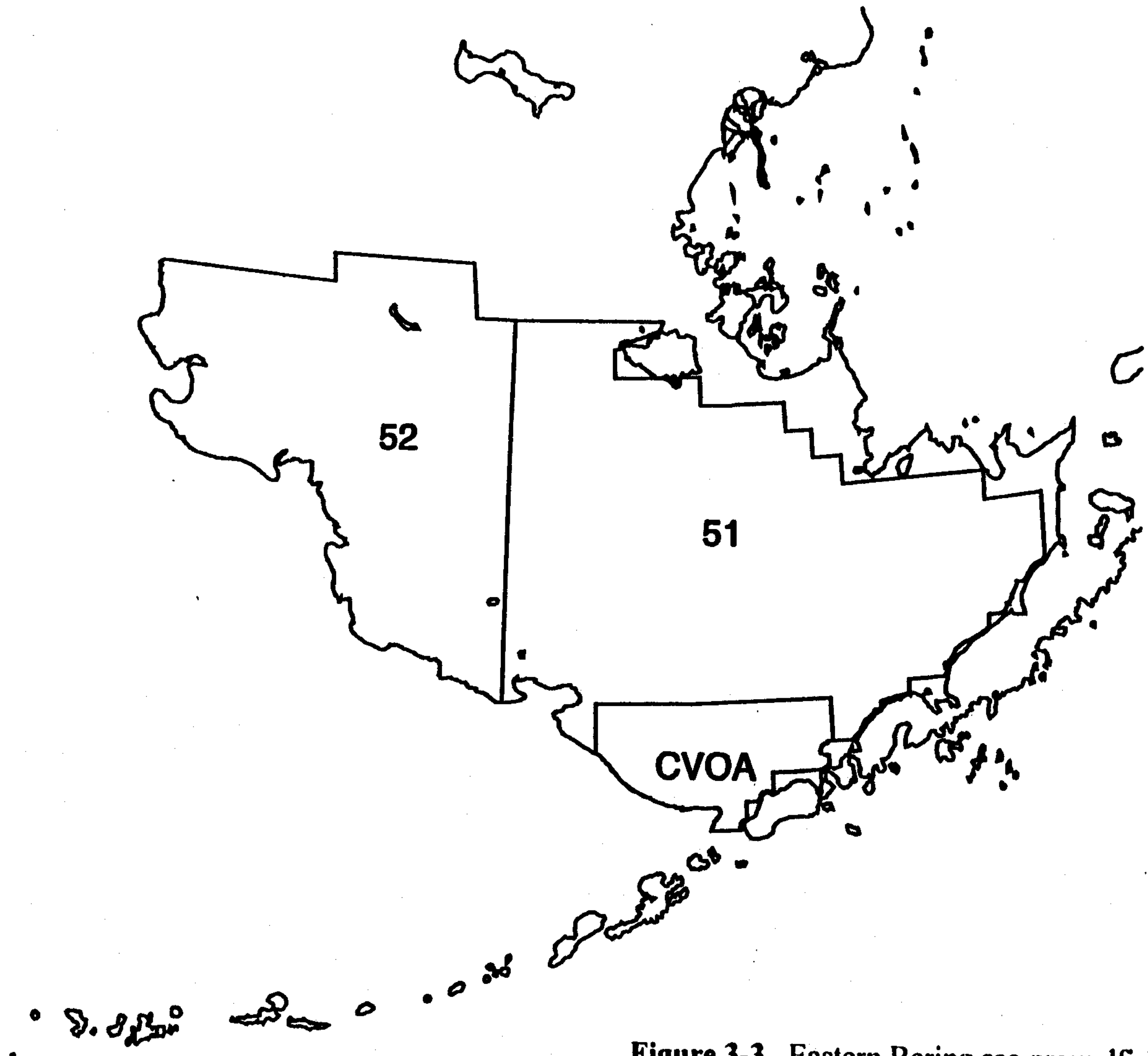


Figure 3-3. Eastern Bering sea groundfish bottom trawl survey areas.

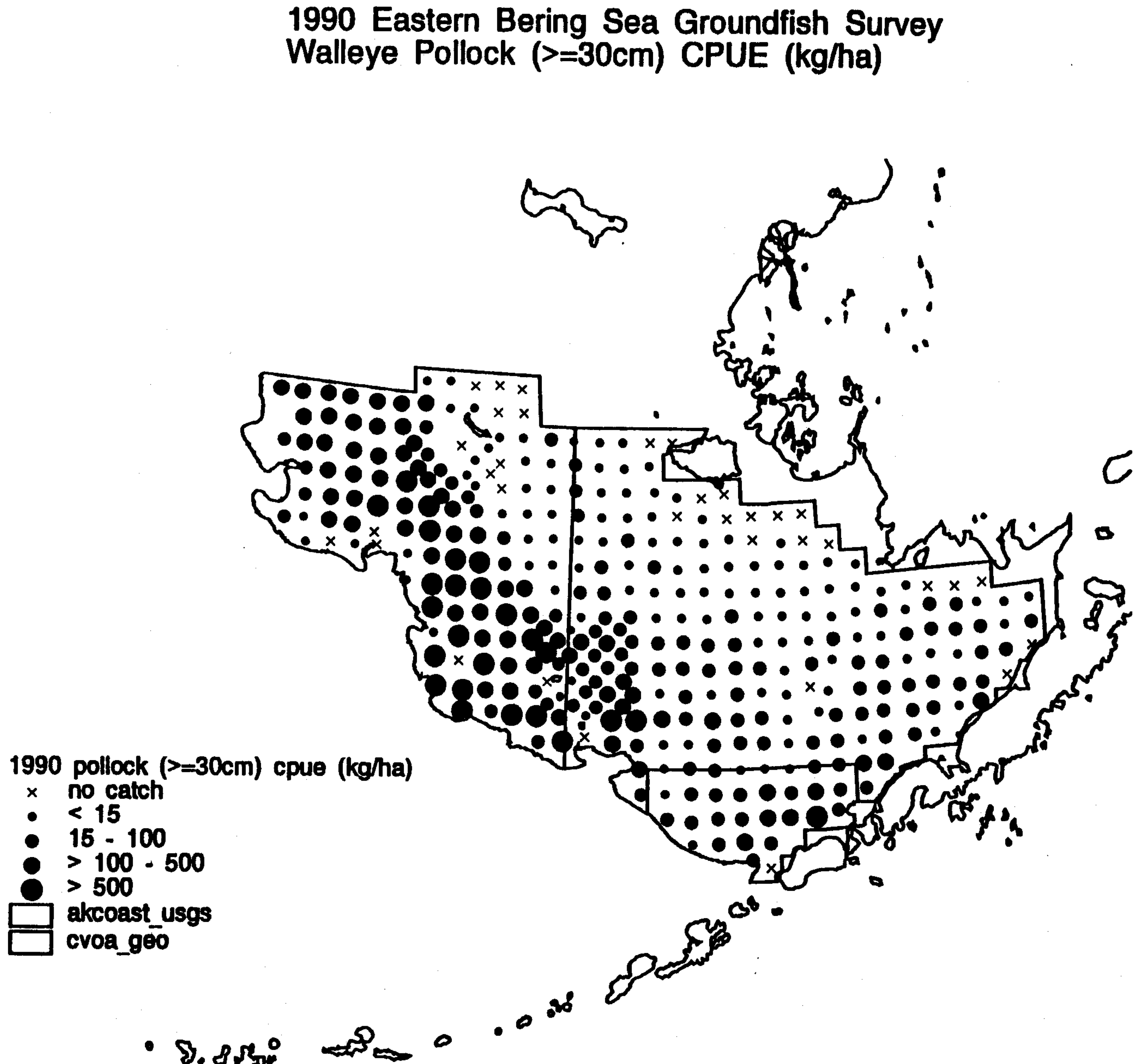


Figure 3-4. Haul-by-haul exploitable (30+ cm in length) pollock catch-per-unit-effort (CPUE=kg/hectare) from the 1990 Eastern Bering sea groundfish bottom trawl survey.

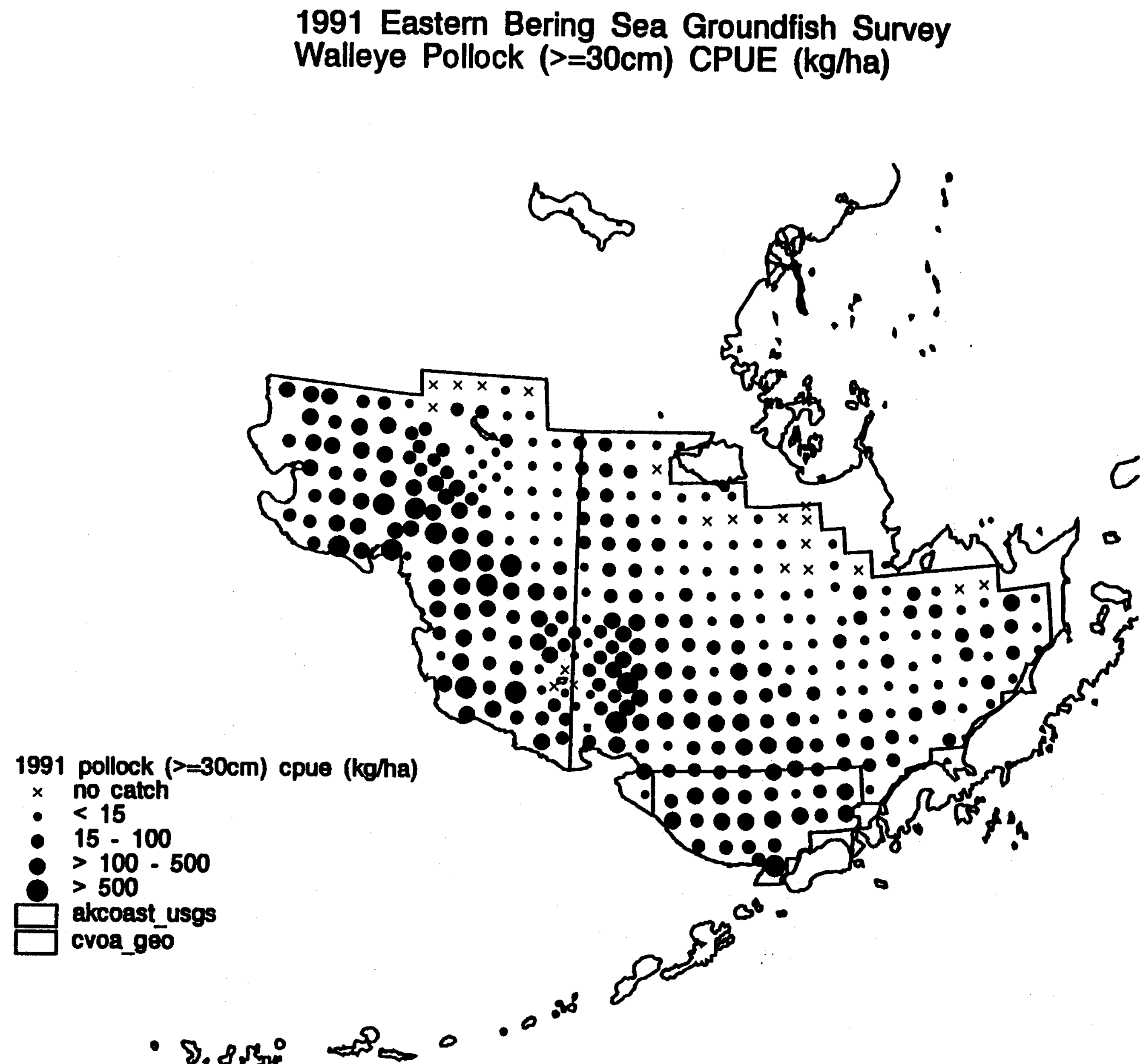


Figure 3-5. Haul-by-haul exploitable (30+ cm in length) pollock catch-per-unit-effort (CPUE=kg/hectare) from the 1991 Eastern Bering sea groundfish bottom trawl survey.

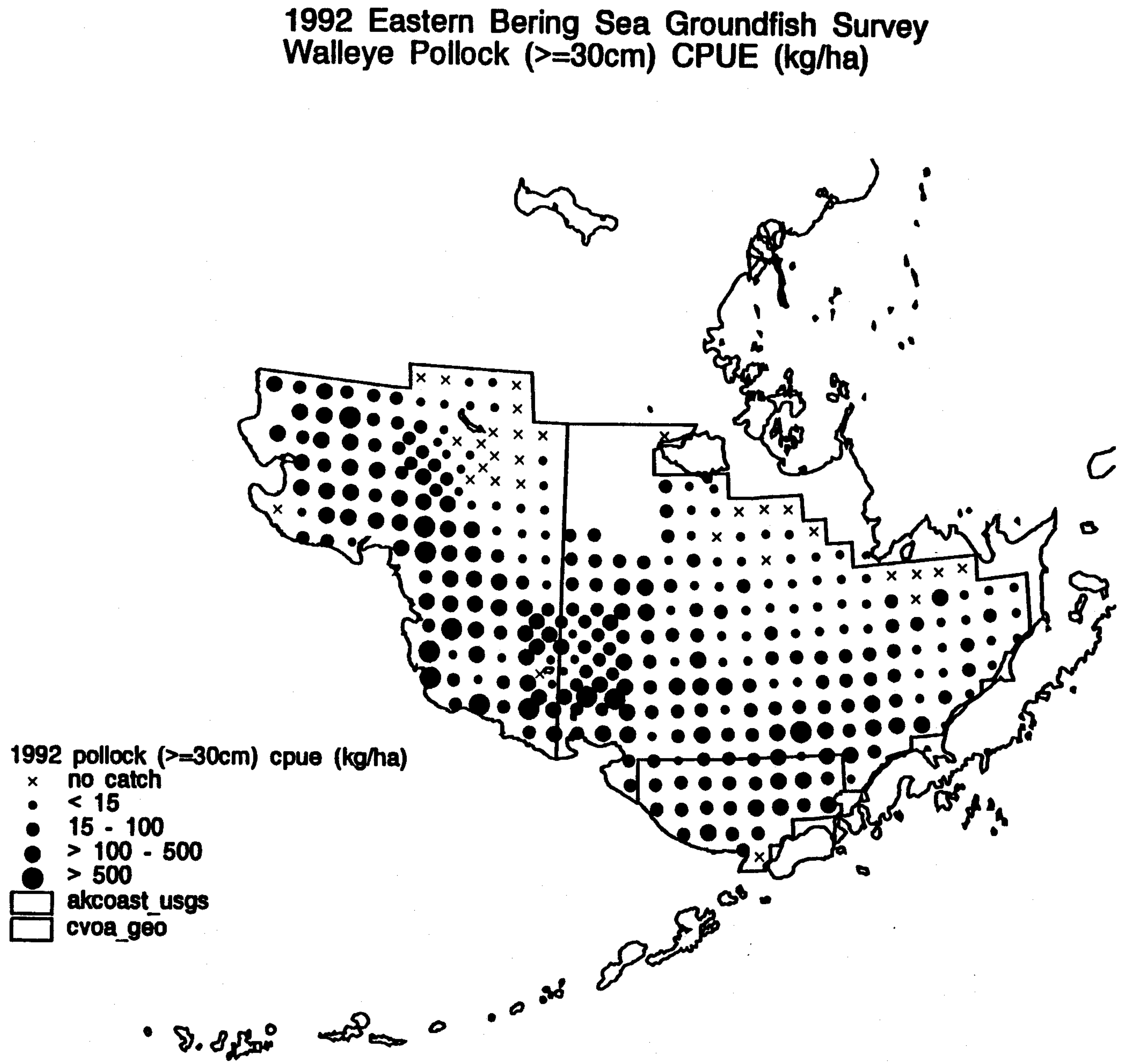


Figure 3-6. Haul-by-haul exploitable (30+ cm in length) pollock catch-per-unit-effort (CPUE=kg/hectare) from the 1992 Eastern Bering sea groundfish bottom trawl survey.

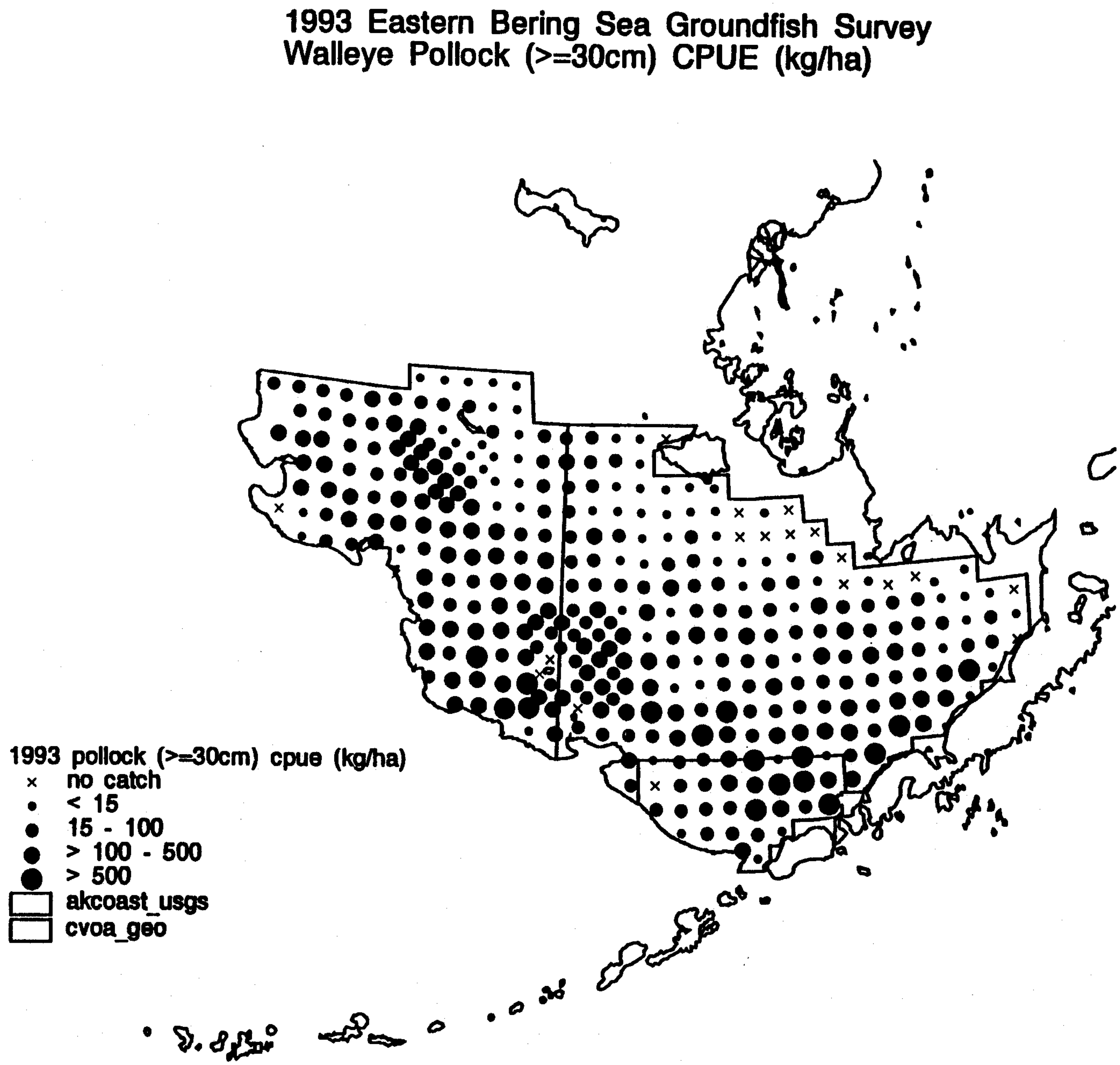


Figure 3-7. Haul-by-haul exploitable (30+ cm in length) pollock catch-per-unit-effort (CPUE=kg/hectare) from the 1993 Eastern Bering sea groundfish bottom trawl survey.

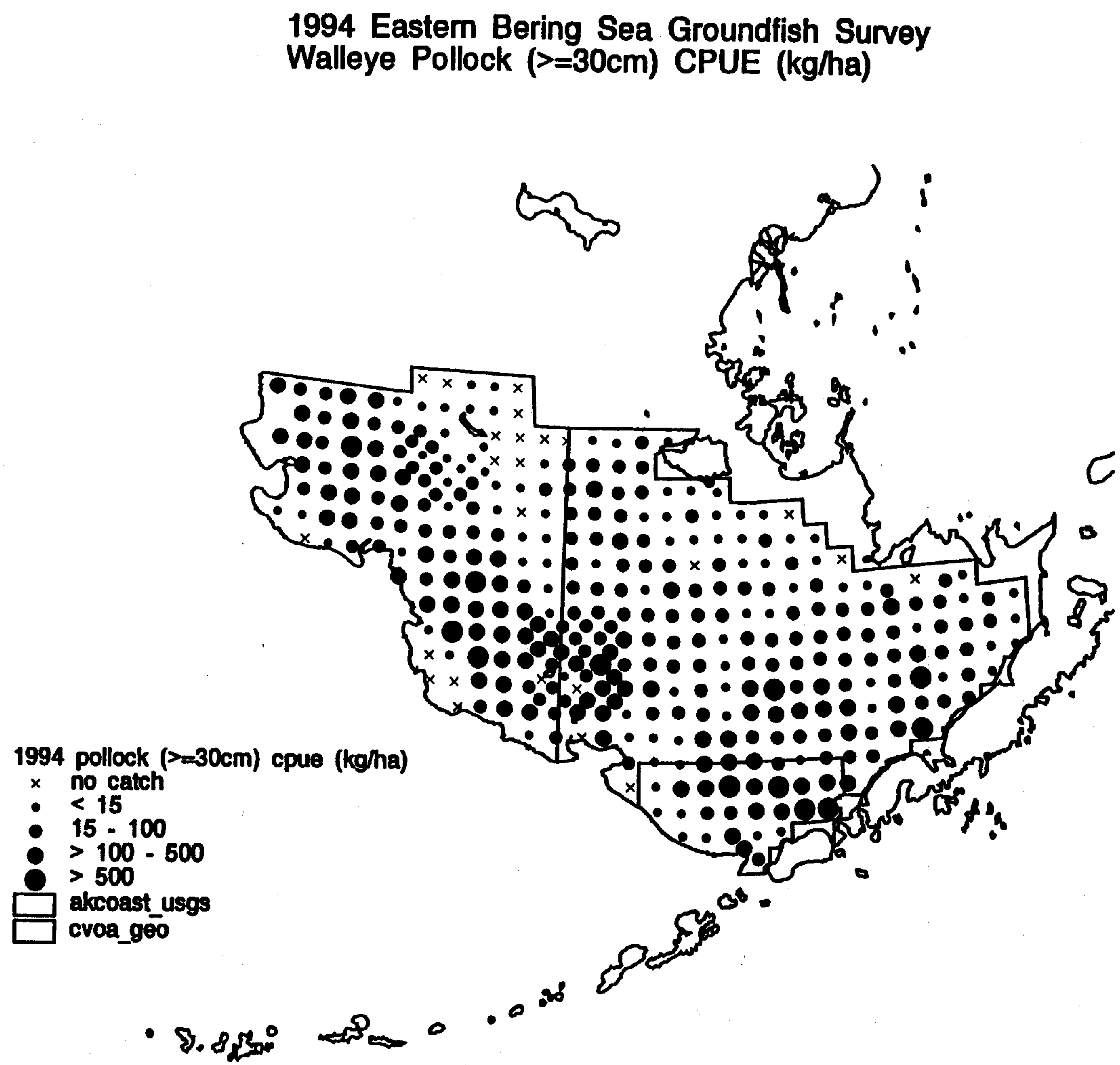


Figure 3-8. Haul-by-haul exploitable (30+ cm in length) pollock catch-per-unit-effort (CPUE=kg/hectare) from the 1994 Eastern Bering sea groundfish bottom trawl survey.

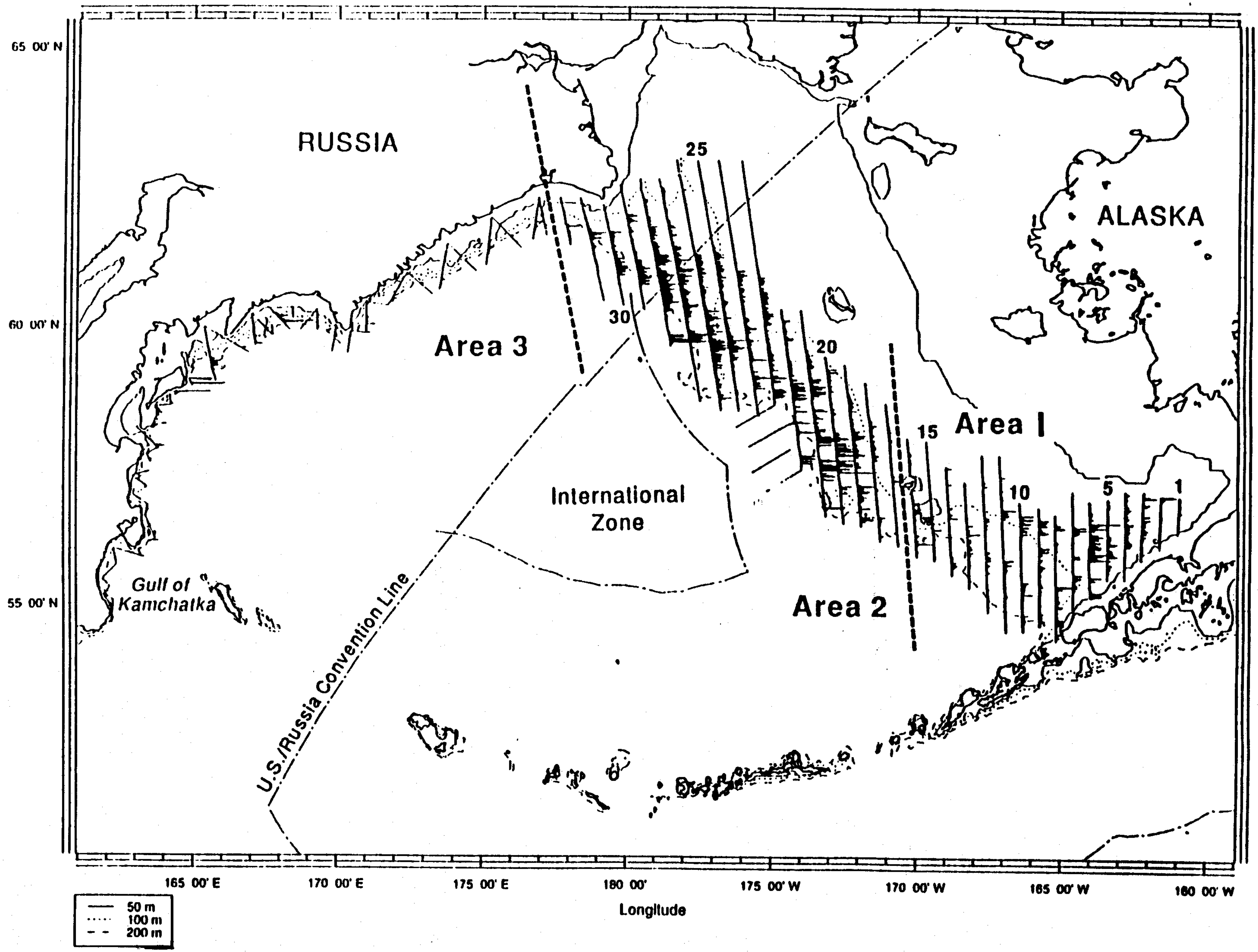


Figure 3-9. Transects during the 1994 echo integration-midwater trawl survey of the Bering Sea shelf, MF94-07. Deflections off transect lines indicate relative fish density.

Table 3-2. Estimated total and exploitable (30+ cm) pollock biomass (mt) by area based on the 1990-94 bottom and echo-integration midwater trawl (EIMWT) surveys, bottom trawl standard survey area only. See Figure 3-3 for areas. In years when combined surveys were not conducted, the ratio of combined/bottom total or exploitable biomass from an adjacent year was used (1991 ratio used in 1990 and 1992; 1994 ratio used in 1993). To estimate separate CVOA and Area 51 area biomasses in 1991 in EIMWT survey, the ratio of CVOA/Area 51 from the 1994 EIMWT survey was used.

A. Estimated Total Pollock Population by Area

	Metric Tons				Percent		
Year	Area 51	Area 52	CVOA	EBS	Area 51	Area 52	CVOA
1990	1,161,344	7,416,027	910,216	9,487,587	12%	78%	10%
1991	1,839,289	3,518,110	1,093,245	6,450,645	29%	55%	17%
1992	1,736,505	3,707,724	385,305	5,829,535	30%	64%	7%
1993	2,669,215	4,961,279	1,067,882	8,698,376	31%	57%	12%
1994	2,310,803	3,815,396	1,310,665	7,436,863	31%	51%	18%

B. Estimated Exploitable Pollock Population by Area

	Metric Tons				Percent		
Year	Area 51	Area 52	CVOA	EBS	Area 51	Area 52	CVOA
1990	1,030,946	6,467,835	757,786	8,256,567	12%	78%	9%
1991	1,629,164	2,951,467	909,914	5,490,545	30%	54%	17%
1992	1,542,872	3,198,328	320,649	5,061,849	30%	63%	6%
1993	2,625,991	4,522,632	1,067,640	8,216,263	32%	55%	13%
1994	2,288,999	3,419,640	1,310,347	7,018,986	33%	49%	19%

C. Application of Areal Exploitable Percentages to Model Estimates of EBS 3+ Biomass

	Metric Tons			
Year	Area 51	Area 52	CVOA	EBS*
1990	1,145,250	7,184,946	841,804	9,172,000
1991	2,028,983	3,675,797	1,133,220	6,838,000
1992	2,459,159	5,097,764	511,077	8,068,000
1993	2,445,328	4,211,483	994,189	7,651,000
1994	2,227,694	3,328,053	1,275,253	6,831,000

* from Wespestad (1994)

Total and exploitable pollock biomasses were estimated for each year (1990-94) and each area (CVOA, and Areas 51 and 52 outside of the CVOA) based on the ratios of combined/bottom biomass by area in 1991 and 1994 (Table 3.2). The 1991 combined/bottom ratios were used to compute midwater fractions in 1990 and 1992, while the 1994 combined/bottom ratios were used to compute midwater fractions in 1993. Separate estimates of the midwater fractions of both pollock biomasses in the CVOA in 1991 were obtained by using the CVOA/Area 51 ratios for the appropriate pollock fraction from the 1994 EIMWT survey. Using the 1994 areal midwater ratios was thought to be appropriate since the areal bottom ratios in 1991 and 1994 were similar. The percentages of estimated combined survey exploitable biomass in each area were applied to the age 3+ EBS pollock biomass from age-structured modeling (Wespestad 1994), yielding areal estimates of exploitable biomass from 1990-94 (Table 3.2). These will be compared (in the next section) to estimates of B-season (and annual) pollock catch in each area in 1990-93 to obtain estimates of areal pollock harvest rates.

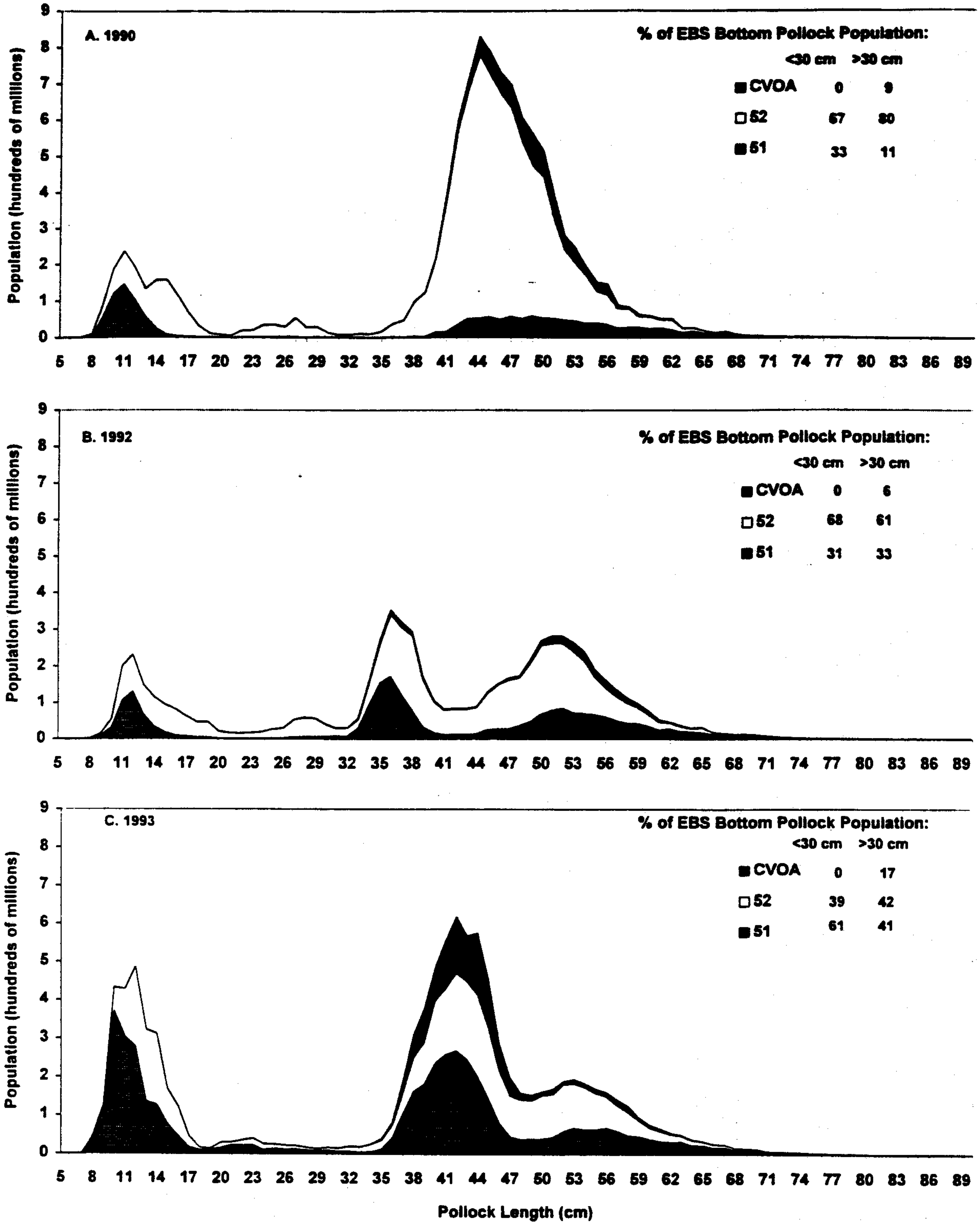
Size Distribution. The bottom trawl survey pollock population by length and area conducted in 1990, 1992 and 1993 are shown in Figure 3.10, while the combined midwater and bottom survey results for 1991 and 1994 are shown in Figures 3.11 and 3.12. Based on the bottom trawl data (Figure 3.10), the CVOA has had virtually no pollock < 30 cm in the summer, and between 6-17% of the total EBS exploitable pollock (by number). The bottom trawl surveys show a shift in distribution of 30+ cm pollock to the southeast between 1990-1993. The 1991 combined EIMWT-bottom trawl data (Figure 3.11) show that the juvenile and exploitable pollock populations were distributed similarly in 1991, with about 64% of both in area 52, and about 36% of both in combined area 51 and the CVOA. In the 1994 combined results, the shift of the exploitable population to the southeast is evident in the drop to 58% in the fraction located in area 52, while the CVOA and area 51 increased to 17% and 25% by number, respectively. Almost all of the juvenile pollock (91%) < 30 cm in length were located in area 52 in 1994.

3.2.3 Catch and Size Distribution of Pollock Fisheries, 1990-93

Catch Distribution and Areal Exploitation Rates. Areas defined in this analysis are shown in Figure 3.13. These were defined for two reasons. First, statistical reporting area 518, the Bogoslof district, was closed beginning in 1992 to protect the declining stock of Aleutian Basin and Donut Hole pollock. This also closed the southwestern portion of the CVOA which had been fished for pollock primarily during the A season (CVOA-518). Consequently, since only the shelf portion of the CVOA (CVOA-SHELF) was open to directed pollock fishing, this area was defined separately. Secondly, pollock northwest of the Pribilof Islands are generally smaller at age and the population composed of younger fish than those on the southeast shelf between the Pribilofs and Unimak Island (including inside the CVOA). Because of this, it would not be appropriate to lump all areas outside of the CVOA for comparison of pollock CPUE and other data with the CVOA. The area outside of the CVOA was divided east and west of 170°W longitude, or the boundary of INPFC areas 51 and 52. AREA 51 contains all the area outside of the CVOA and the Bogoslof district (518) in INPFC area 51; AREA 52 is the entire INPFC area 52.

Table 3.3 contains estimates of areal pollock catch distribution in the eastern Bering Sea in 1990-94 by sectors and season (A and B-seasons, the latter of which includes CDQ catches). Catch estimates were calculated using both observed catch distribution by sector and area (1990-93) and blend catch estimates by sector and area (1990-94). Because of the CVOA itself could not be identified within the blend data, the observed data was used to apportion the blend data within each season and sector. In 1994, 1993 distributions were used, since the blend proportions within INPFC areas 51 and 52 were similar in both years. In 1990, seasonal pollock catches were assumed to be 40% in A-season and 60% in B-season; inshore-offshore ratios by season were those of 1991. Plots of midwater pollock trawl locations for both processor types during each season are shown in Appendix 1. Only the B-season data and plots will discussed in detail here since the CVOA will only be enforced during the B-season. Areal differences in pollock CPUE will be discussed in a subsequent section.

Figure 3-10. 1990, 1992 and 1993 Bottom trawl survey pollock population estimates by length and area.



Bottom trawls do not accurately survey pollock 20-30 cm in length.

Figure 3-11. 1991 Eastern Bering Sea pollock population (numbers) by length in Areas 51 and 52 based on bottom trawl and EIMWT surveys. Bottom=0-3 m off bottom; midwater=surface to 3 m off bottom. Midwater data unavailable for CVOA separately.

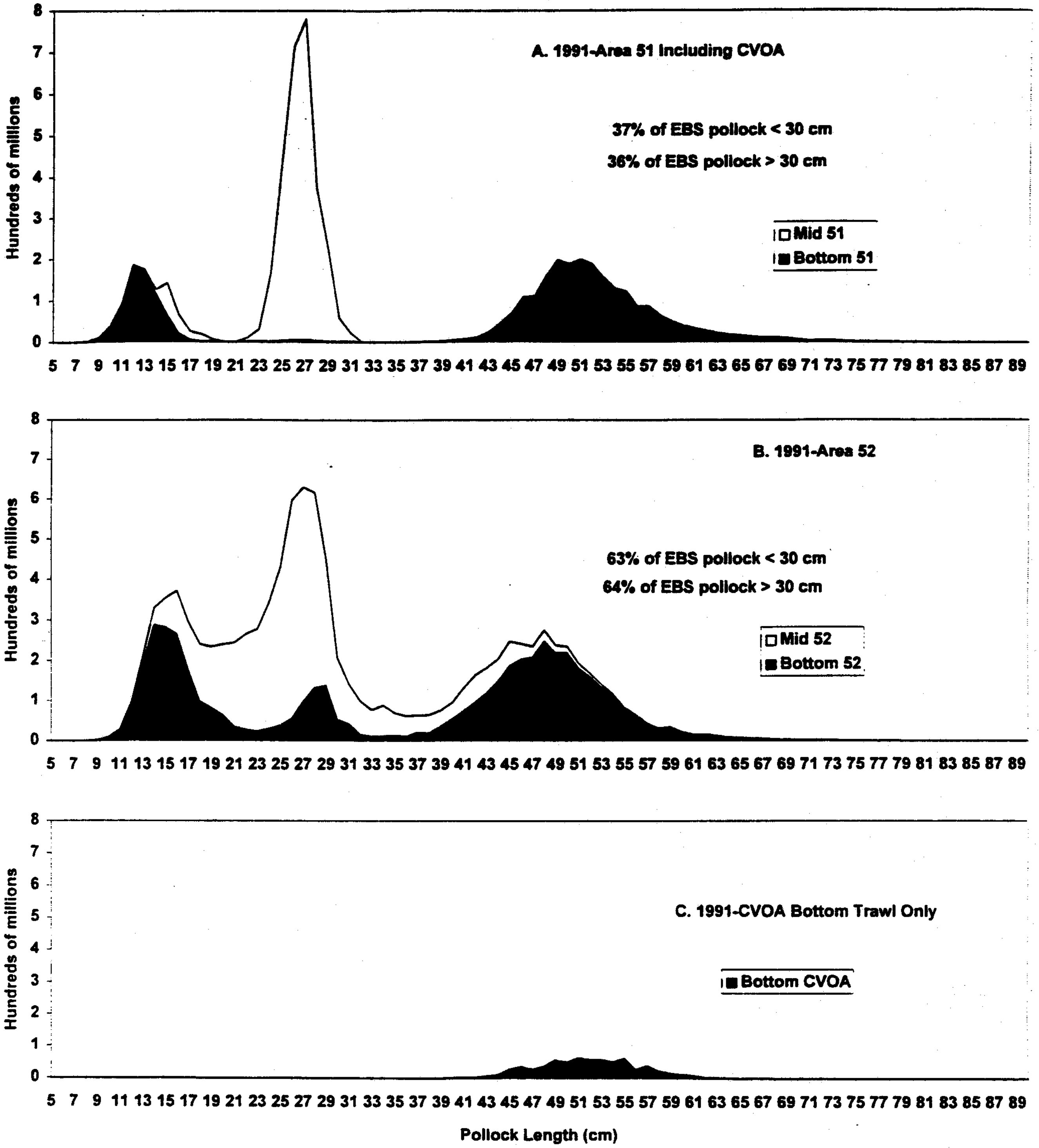
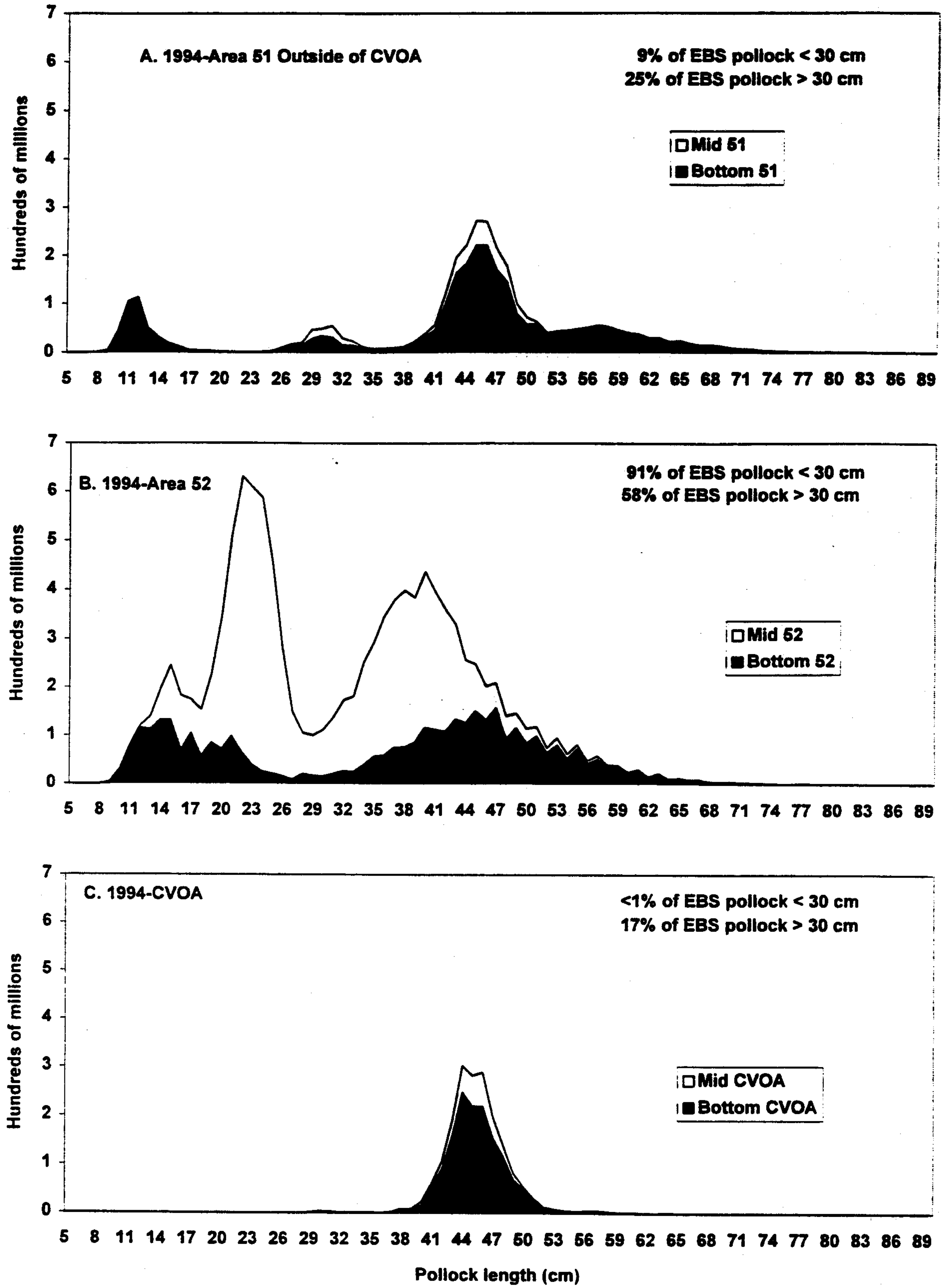


Figure 3-12. 1994 Eastern Bering Sea pollock population (numbers) by length in the CVOA and in Areas 51 and 52 outside the CVOA based on bottom trawl and EIMWT surveys. Bottom = 0-3 m off bottom; midwater = surface to 3 m off bottom).



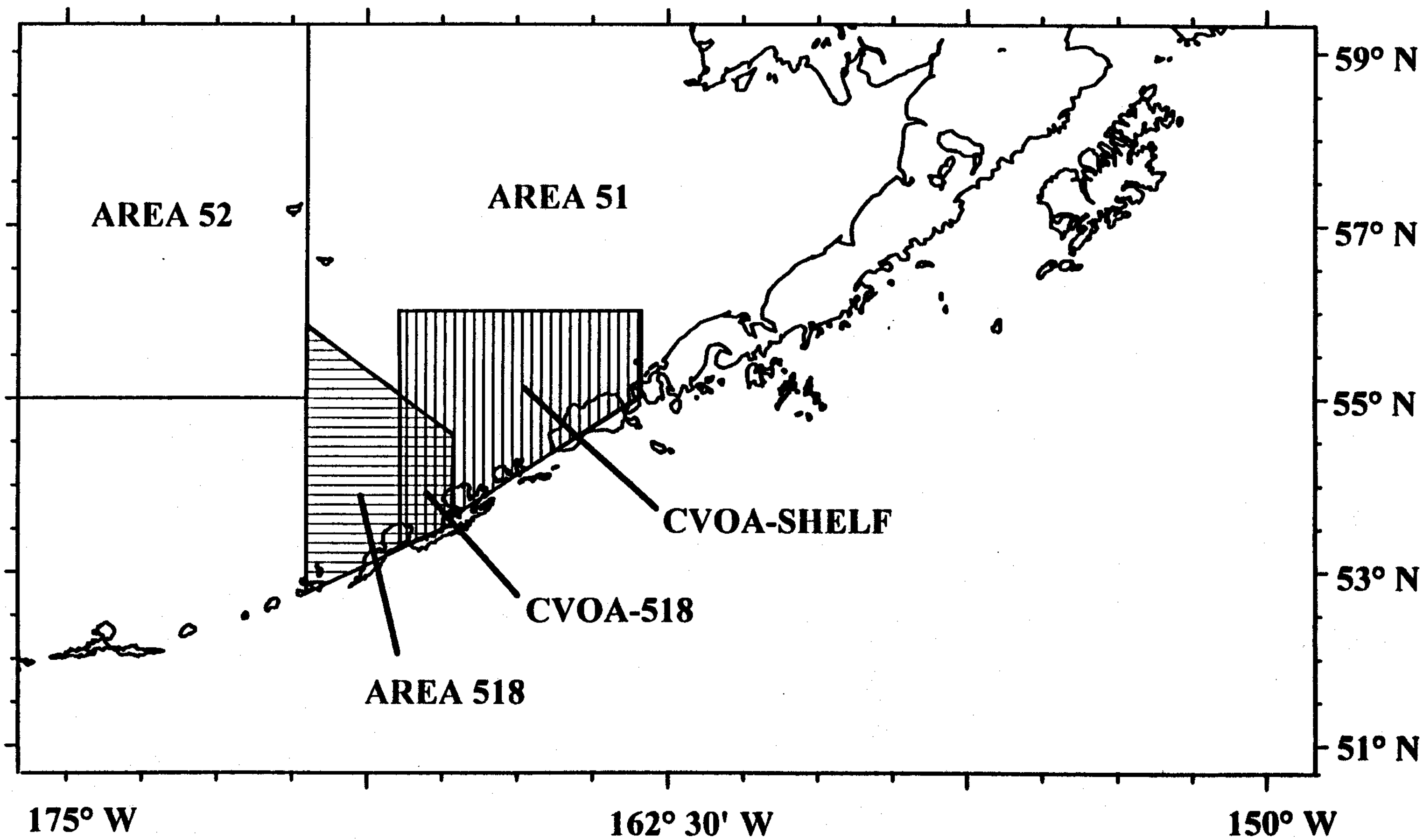


Figure 3-13. Areas in the Eastern Bering Sea defined for analysis of pollock fishery bycatch, catch per unit effort, and length frequency. The Catcher Vessel Operational Area (CVOA) extends from 163°-168°W longitude, south of 56°N latitude, and overlaps the Bogoslof district (Area 518) in the area labelled CVOA-518. Areas outside the CVOA and 518 are divided at 170°W longitude (AREAS 51 and 52).

Table 3-3. Distribution of pollock catch (A-season and B-season; latter includes CDQ in 1992-94) and summer pollock biomass by area (Table 3-2C). Harvest rate is Catch/Biomass * 100. See note below regarding annual harvest rate calculations.

		A-Season			B-Season			Annual	Summer Exploitable	Harvest Rate	
Year	Zone	Offshore	Onshore	Total	Offshore	Onshore	Total	Catch	Biomass	B-Season	Annual*
1990	CVOA-518	2,846	4,359	7,205				7,205			
	CVOA-SHELF	71,389	89,510	160,899	21,517	222,931	244,448	405,347	841,804	29.0%	48.2%
	Area 518	141,533	12,554	154,087				154,087			
	Area 51	154,791	22,675	177,467	26,851	3,147	29,998	207,465	1,145,250	2.6%	18.1%
	Area 52	38,928	214	39,142	533,536	218	533,753	572,896	7,184,946	7.4%	8.0%
1991	CVOA-518	7,072	12	7,084				7,084			
	CVOA-SHELF	112,978	136,202	249,180	22,605	221,214	243,819	492,999	1,133,220	21.5%	43.5%
	Area 518	322,325	4,976	327,302				327,302			
	Area 51	9,175	1,232	10,407	83,526	23,549	107,075	117,482	2,028,983	5.3%	5.8%
	Area 52	1,358	0	1,358	523,596	5,045	528,641	529,999	3,675,797	14.4%	14.4%
1992	CVOA-SHELF	117,949	123,971	241,920	10,923	243,859	254,783	496,703	511,077	49.9%	97.2%
	Area 51	169,237	2,366	171,603	5,076	9,635	14,710	186,313	2,459,159	0.6%	7.6%
	Area 52	99,287	79	99,366	437,494	8,164	445,658	545,024	5,097,764	8.7%	10.7%
1993	CVOA-SHELF	77,937	170,296	248,233	67,645	231,873	299,518	547,750	994,189	30.1%	55.1%
	Area 51	169,005	6,838	175,843	218,802	3,067	221,869	397,713	2,445,328	9.1%	16.3%
	Area 52	86,267	221	86,488	114,404	1,040	115,444	201,932	4,211,483	2.7%	4.8%
1994	CVOA-SHELF	109,808	172,512	282,320	55,878	234,747	290,624	572,945	1,275,253	22.8%	44.9%
	Area 51	238,119	6,927	245,046	180,739	3,105	183,845	428,890	2,227,694	8.3%	19.3%
	Area 52	3,376	57	3,433	157,165	25	157,190	160,623	3,328,053	4.7%	4.8%

* Annual harvest rates over-estimate the actual areal harvest rates in the CVOA-SHELF and in Area 51. Summer biomass distribution patterns do not represent spawning aggregations which are fished in the CVOA-SHELF and Area 51 during the A-season.

In 1990, catcher-processors caught 95% of their B-season pollock in area 52. By contrast, catcher boats for inshore processors caught almost 100% of their B-season pollock within the CVOA-Shelf. Catcher boats fished primarily in the center of the CVOA, in the area north of Akutan and Akun Islands north and west of Unimak Pass, and along the 200 m isobath. The pattern of B-season pollock fishing in 1991 was similar to 1990, where catcher processors fished primarily in area 52 (83% of their catch), while catcher boats fished primarily in the CVOA-Shelf (84% of their catch).

In 1992, the CVOA first became enforced during the B-Season (which began 1 June). Catcher processors continued the pattern they exhibited during the previous two years and caught the vast majority of the B-season pollock in area 52 (95%), and the remainder in area 51 east of the Pribilof Islands. Similarly, catcher boats continued their pattern of B-season harvest, catching 93% of their pollock within the CVOA-Shelf. Catcher boats fished the same area on the CVOA-shelf that they had used in 1990 and 1991, which was basically a Y-shaped area extending northeast on the shelf from Akutan Island to north of Unimak Island, and the other branch from the Horseshoe area northwest along the 200 m isobath. The north-central area and the eastern quarter of the CVOA was not utilized by the inshore catcher boats for midwater pollock fishing. The CVOA did not significantly alter fishing patterns for either sector in 1992 compared to both 1990 and 1991.

In both the 1993 and 1994 B-seasons (which began 15 August each year), catcher-processors fished in much different areas than they had the previous three years. Area 51 provided about 65% and 46% of the catcher processor's B-season catch in 1993 and 1994, respectively, while area 52 (chiefly in the area south of the Pribilof Islands) provided most of the remainder. The areas fished by the offshore sector during the B-seasons may have reflected their desires to avoid the smaller members of the 1989 year-class, which dominated the fishery landings at this time throughout the eastern Bering Sea; smaller individuals of a pollock cohort are generally found north and west of the Pribilof Islands. Consequently, the offshore sector was apparently "squeezed" during the B-season between their expectations of smaller pollock in area 52 and the northern and western boundaries of the CVOA. Most of the offshore sector's B-season landings in 1993 came from an area only lightly exploited in previous years, located on the central shelf north of the CVOA (56°N) between 164-166°W (mostly west of the red king crab savings area). Catcher boats fished in the 1993 and 1994 B-seasons in basically the same manner as during the 1990-92 B-seasons, with 98% of their pollock landings coming from the CVOA-Shelf in both years.

The areal catch and exploitable biomass distributions in Table 3.2C and Table 3.3 were combined to compute areal harvest rates over the last 5 years (Table 3.3). Only the harvest rates utilizing B-season catches and summer biomasses accurately reflect the proportions of the population in each area that were removed during the summer each year. B-season harvest rates vary greatly by area within the southeastern Bering Sea. B-season harvest rates within the CVOA-Shelf have been consistently higher (ranging from 22-50% in 1990-94) than in either of the areas outside of the CVOA in Areas 51 and 52 (ranging from 1-14%).

B-season harvest rates of pollock in Area 52 were lower in 1993-94 than in 1990-92 because the offshore fleet apparently tried to avoid smaller members of the 1989 cohort. B-season removals from Area 52 declined from between 446,000-534,000 mt in 1990-92 to 115,000 and 157,000 mt in 1993 and 1994. Because of this shift, B-season harvest rates and total pollock removals from Area 51 and the CVOA-Shelf increased. B-season removals from Area 51 increased from a range of 15,000-107,000 mt in 1990-92 to 184,000 and 222,000 mt in 1993 and 1994. Similarly, B-season removals from the CVOA-Shelf increased from a range of 244,000-255,000 mt in 1990-92 to 291,000 and 300,000 mt in 1993 and 1994.

Annual harvest rates for the CVOA-SHELF and Area 51 (Table 3.3) over-estimate the actual annual areal rates because the spawning concentrations of pollock that occur in winter are not represented in the summer biomass distribution. Because of these spawning aggregations, A-season pollock catches have also concentrated within the CVOA-SHELF. This seasonal trend added on to the differences in B-season distribution of catch noted above resulted in much greater removals of pollock from east of 170°W (CVOA-Shelf and Area 51) than from area 52 in 1993-94 than in 1990-92.

3.2.3.2 Size Distribution

Pollock lengths obtained by observers aboard fishing vessels in the eastern Bering Sea were accumulated by year (1990-93), time period (January-April, May-July, and August-December), area (Figure 3.13), gear (bottom trawl and pelagic trawl), and processor type (catcher/processors and catcher boats for inshore processors). The years were chosen to contrast fishery length-frequencies from two years prior to the establishment of the CVOA (1990-91) with two years with the CVOA in place (1992-93). The time periods were chosen to represent the A-season (January-April) and the various B-seasons, which started at different times in each of the years: 1990 and 1991: June 1; 1992, offshore sector: June 1; 1992, inshore sector, voluntary delay until July; 1993: August 15. The 1993 August-December data includes some pre-B-season data, which is why there are length-frequency data collected aboard catcher processors from within the CVOA. Only length data from pollock caught by pelagic trawls were used since this would best represent the directed pollock fishery. Data are summarized in tabular form in Table 3.4, and are displayed for the January-April period in Figures 3.14 and 3.15 for catcher-processors and catcher boats, and for May-July and August-December in Figures 3.16-3.19. Only B-season data will be discussed in detail.

1990

In both May-July and August-December 1990 (Figure 3.16), mean pollock lengths caught by catcher-processors and catcher boats were largest in the CVOA-SHELF (ranging from 48.09-51.42 cm), intermediate in AREA 51 outside of the CVOA (ranging from 44.45-46.09 cm), and smallest in AREA 52 (ranging from 39.01-41.84 cm). Conversely, the percentage of the measured fish that were less than 30 cm in length was highest in AREA 52, intermediate in AREA 51, and smallest in the CVOA-SHELF. This pattern generally represents the distribution of the pollock population during the 1980s when the domestic fishery developed, and what would be expected with several large old year-classes in the population. In 1990, two large year-classes, one spawned in 1982 and the other in 1984, accounted for almost 50% of the catch by numbers of the entire year's fishery (A and B seasons); furthermore, over 70% of the catch by numbers were of pollock aged 6 years and older. This is reflected in the broad peaks in the length-frequency distributions from approximately 40-60 cm and the large variances in size.

1991

In May-July 1991 (Figure 3.17), the size and importance of the 1989 year-class first became apparent in the fishery (modes in the mid-20 cms). However, for the entire year of 1991 (A and B-seasons), almost 80% of the catch in numbers was composed of pollock aged 6 years and older. The fishery targeted on the same mix of age classes that were fished in 1990, but it could not avoid the 1989 year-class in some areas, which lowered the mean length of pollock caught (only in May-July) and increased the percentage < 30 cm. In May-July, both catcher-processors and catcher vessels had larger percentages of pollock < 30 cm in the CVOA-SHELF than in AREA 51 suggesting that the 1989 year-class was in greater abundance on the outer than on the inner shelf at that time. The mean pollock length was similar in the two areas for catcher-processors (47.64 and 47.75 cm in the CVOA-SHELF and AREA 51, respectively), but was larger outside of the CVOA in AREA 51 (48.20 cm) than in the CVOA-SHELF (47.00 cm) for catcher boats. Mean pollock length was smallest and the percentage < 30 cm was greatest in AREA 52 than in either of the other two areas in May-July.

In August-December, both catcher-processors and catcher vessels successfully avoided the 1989 year-class, catching principally aged 6+ individuals. Mean lengths in August-December were greater, and percentages < 30 cm were smaller in each area than in May-July. Catcher-processors had similar mean pollock lengths in the CVOA-SHELF (49.78 cm) and AREA 51 (49.42 cm), but a smaller mean length in AREA 52 (43.91 cm); percentages < 30 cm were greatest in AREA 52 and smallest in the CVOA-SHELF. Catcher-boats did not fish much in AREA 51 during August-December. The mean sizes of pollock they caught in AREA 52 (48.02 cm) was only slightly smaller than in the CVOA-SHELF (49.19 cm), and the percentage < 30 cm was also smaller in AREA 52 (0.87%) than in the CVOA-SHELF (3.69%).

1992

The 1989 year-class became of major importance in 1992 (Figure 3.18), comprising the principal modal length caught by the fishery in the B-season. The 1989 year-class comprised a third of all pollock caught (by number) during both the A and B-seasons in 1992. Its importance in the catches was also reflected in a decline in the percentage (to 55%) of the catch composed of pollock age 6+ years. Age 3 pollock have had an average selectivity of only 0.23, but when their abundance is high, the selectivity could be greater.

The Inshore/Offshore FMP Amendment 18 became effective in 1992 at the same time that the 1989 year-class began to recruit to the fishery. By coincidence, this provides a "test" of the impact that the CVOA could have on the ability of catcher-processors to locate and catch pollock of marketable size (> 30 cm). In the early B-season, catcher-processors fished only outside of the CVOA for pollock. Mean pollock length was greater in AREA 51 (47.41 cm) than in AREA 52 (40.98 cm), and the percentage < 30 cm was also smaller (2.6% in 51 compared to 10.4% in 52). The average length and percentage < 30 cm in AREA 51 were similar for the same period in 1991, while for AREA 52, the average length was about 1 cm smaller in May-July 1992 than 1991 for catcher-processors.

Because the inshore sector had its own B-season allocation, they voluntarily chose to postpone the start of their B-season fishery until later than June 1 because of the large numbers of 1989 Year-class pollock located within the CVOA at that time. Some boats fished in July and their pollock catches throughout the three areas had much smaller mean lengths than in May-July 1991 due to the dominance of the 1989 Year-class. In both the CVOA-SHELF and AREA 51, mean lengths were between 41.5 and 42 cm, and the percentages < 30 cm were higher in AREA 51 (2.5%) than in the CVOA-SHELF (0.6%), both much lower than the same time period in 1991. The mean length was lower (37.64 cm) and the percentage < 30 cm (8.2%) was higher in AREA 52 than either of the two areas to the southeast at this time. In May-July, mean pollock lengths caught by catcher-processors were greater than those caught by catcher boats in both AREAS 51 and 52; percentages < 30 cm were about the same in AREA 51 for both sectors, but catcher-processors had a higher percentage of pollock < 30 cm in AREA 52 than did catcher boats.

The offshore B-season closed on July 28, 1992, while the inshore B-season remained opened until September 22. For catcher-processors, pollock measured during August-December were all caught during the CDQ fishery in December. At this time, the 1989 Year-class was encountered more frequently in the CVOA-SHELF, resulting in a smaller mean length there (40.61 cm) than in either of the areas outside the CVOA (AREA 51: 47.79 cm; AREA 52: 49.60 cm). Percentages < 30 cm were very small in all areas in December for catcher-processors. Catcher boats fished almost exclusively within the CVOA-SHELF during their late B-season, and had only a slightly larger mean pollock length (41.3 cm) than did catcher-processors, but a similarly low percentage < 30 cm.

1993

In 1993 (Figure 3.19), the 1989 Year-class dominated pollock catches of all sectors as a single mode centered in the low 40 cms. Catch-at-age analysis revealed that for the year (combined A and B-seasons), the 1989 Year-class comprised almost 60% of the catch (in numbers), while the percentage of age 6+ year-old fish declined to about 20%. The dominance of the 1989 Year-class in the catches from May-December is evidenced by the single modes and the low variances compared with all other years.

The 1993 B-season started on August 15 for both sectors, however some catcher-processors participated in the CDQ fishery before this, which is why there is data from the CVOA-SHELF for the offshore sector in both the

May-July and August-December periods. In May-July, mean pollock lengths were similar in the CVOA-SHELF and AREAS 51 and 52 (41-42 cm); percentages < 30 cm were 0 in both the CVOA-SHELF and outside the CVOA in AREA 51.

From August-December, catcher-processors and catcher boats had very similar size distributions of pollock in each of the three areas fished. Mean pollock lengths only ranged between 41.92-44.13 cm, and the highest areal percentage < 30 cm was only 0.82%.

3.2.4 Conclusions

While the distribution of pollock > 30 cm may change from year to year during the summer, surveys conducted in the last 5 years have shown that commercial-sized pollock are widely distributed throughout the southeastern Bering Sea, both inside and outside of the CVOA. From May-December 1990-93 (Table 3.4), only in 4 of 58 sector/time/area cells did any sector of the pollock fishing industry have a mean pollock length less than 40 cm. Furthermore, the year when percentages < 30 cm were highest was 1991, when the 1989 Year-class was unavoidable by both sectors and prior to the establishment of the CVOA and enactment of the Inshore/Offshore amendment.

Pollock are harvested disproportionately to their areal biomass distribution. Harvest rates in the CVOA during the B-season are much higher than in Areas 51 and 52. Furthermore, A-season pollock removals are also concentrated in the CVOA. Due to the distribution of the dominant 1989 year-class and the desire of the fleet to avoid smaller members of that cohort, effort shifted from areas west of 170° W to the southeast in 1993-94. Consequently, if the CVOA had not excluded the offshore fleet during these B-seasons, it is likely that harvest rates and removals from the CVOA would have been greater than they were.

Table 3-4. Pollock size distribution caught by the various fishery sectors using pelagic trawls in three time periods each year, 1990-93.

			A. January-April				B. May-July				C. August-December			
Sector	Year	Zone	Mean Length	N	Variance	% < 30 cm	Mean Length	N	Variance	% < 30 cm	Mean Length	N	Variance	% < 30 cm
Catcher-Processors														
	90	CVOA-518	49.39	2,820	7.02	0.00								
	90	CVOA-SHELF	45.42	21,696	22.30	0.09	49.29	1,232	26.85	0.00	49.58	16,735	34.35	1.90
	90	AREA 518	49.42	89,612	8.47	0.00								
	90	AREA 51	44.63	52,885	30.84	0.15	46.08	13,744	34.26	0.75	46.09	3,980	41.33	3.84
	90	AREA 52	43.57	11,951	32.73	0.37	41.81	141,679	53.97	6.74	40.89	173,906	47.60	6.84
	91	CVOA-518	49.89	1,875	11.43	0.16								
	91	CVOA-SHELF	46.61	41,481	32.06	1.52	47.64	15,545	101.01	11.51	49.78	16,856	41.70	1.75
	91	Area 518	49.90	130,629	12.92	0.01								
	91	AREA 51	44.20	1,393	84.54	11.41	47.75	44,823	38.92	3.19	49.42	6,572	39.86	2.86
	91	AREA 52	37.22	787	80.55	19.44	42.94	165,093	86.05	14.57	43.91	96,992	62.49	8.06
	92	CVOA-SHELF	46.83	40,545	71.22	3.67	36.21	131	5.90		40.61	30,391	15.52	0.00
	92	AREA 51	48.81	47,747	66.12	1.28	47.41	12,876	72.73	2.58	47.79	1,502	70.66	0.20
	92	AREA 52	47.92	36,799	56.05	0.50	40.98	152,847	87.12	10.35	49.60	8,247	79.14	0.35
	93	CVOA-SHELF	42.14	22,395	33.73	0.11	41.93	3,816	13.43	0.00	43.34	26,406	13.64	0.07
	93	AREA 51	47.54	51,309	43.23	0.06	41.06	3,335	9.30	0.00	43.60	80,099	11.92	0.06
	93	AREA 52	43.22	22,125	60.18	0.61	42.12	924	31.38	3.25	42.68	50,405	16.56	0.62
Motherships														
	90	CVOA-518	48.97	332	7.53	0.00								
	90	CVOA-SHELF	45.74	341	23.76	0.00	48.86	332	21.59	0.00	51.42	5,363	16.16	0.21
	90	AREA 518	50.04	22,497	9.34	0.00								
	90	AREA 51	46.32	4,744	33.73	0.04	44.84	684	16.50	0.29				
	90	AREA 52					41.84	14,667	40.39	5.06	39.01	20,145	43.41	6.90
	91	CVOA-SHELF	47.32	18,219	33.58	2.27								
	91	AREA 518	49.81	5,439	9.58	0.00								
	91	AREA 51	46.53	165	15.91	0.00	47.47	2,724	29.47	2.75				
	91	AREA 52	51.64	193	25.19	0.00	44.30	8,604	49.60	4.42	43.24	3,506	56.91	6.96
	92	CVOA-SHELF	41.35	16,465	93.64	8.24					45.07	3,252	54.71	0.00
	92	AREA 51	49.67	4,501	49.02	1.47								
	92	AREA 52	45.53	768	44.42	0.78	37.84	28,721	69.80	14.16				
	93	CVOA-SHELF	41.41	10,269	33.74	0.03					42.97	16,064	7.39	0.00
	93	AREA 51	46.42	2,162	33.56	0.09					43.55	3,722	9.75	0.11
	93	AREA 52	45.77	450	65.55	0.00					42.09	2,803	20.00	2.16
Catcher Boats														
	90	CVOA-518	49.71	765	6.30	0.00								
	90	CVOA-SHELF	44.52	21,004	23.07	0.21	46.09	51,319	26.66	0.40	50.00	50,452	29.50	1.23
	90	AREA 518	49.11	2,509	6.38	0.00								
	90	AREA 51	45.63	4,915	39.33	0.43	44.45	1,837	36.63	3.27	51.60	47	7.66	0.00
	91	CVOA-518					51.58	152	28.23					
	91	CVOA-SHELF	45.81	46,637	20.61	0.50	47.00	78,018	77.94	10.36	49.19	60,919	63.26	3.69
	91	AREA 518	46.92	1,976	11.04	0.00	50.46	114	18.50					
	91	AREA 51					48.20	15,472	49.16	4.56	41.77	240	72.06	10.00
	91	AREA 52					41.52	2,186	121.13	27.72	46.02	3,350	29.51	0.67
	92	CVOA-SHELF	46.97	99,855	35.84	0.64	41.58	39,121	56.15	0.59	41.30	115,343	40.56	0.29
	92	AREA 51	46.94	1,670	63.06	0.54	42.03	12,322	63.62	2.50	40.05	157	21.81	0.00
	92	AREA 52					37.64	4,485	37.81	6.21				
	93	CVOA-SHELF	43.59	87,698	40.06	0.09	44.20	46	12.96		44.13	95,632	15.06	0.00
	93	AREA 51	47.66	3,681	26.42	0.00					43.47	1,661	8.15	0.00
	93	AREA 52									41.92	1,406	9.53	0.00

Figure 3-14. Pollock length-frequencies from observer samples aboard catcher-processors in the eastern Bering Sea in January-April, 1990-93. Only pelagic trawl data are shown. See Figure 3-13 for areas. Sample sizes are shown in legend.

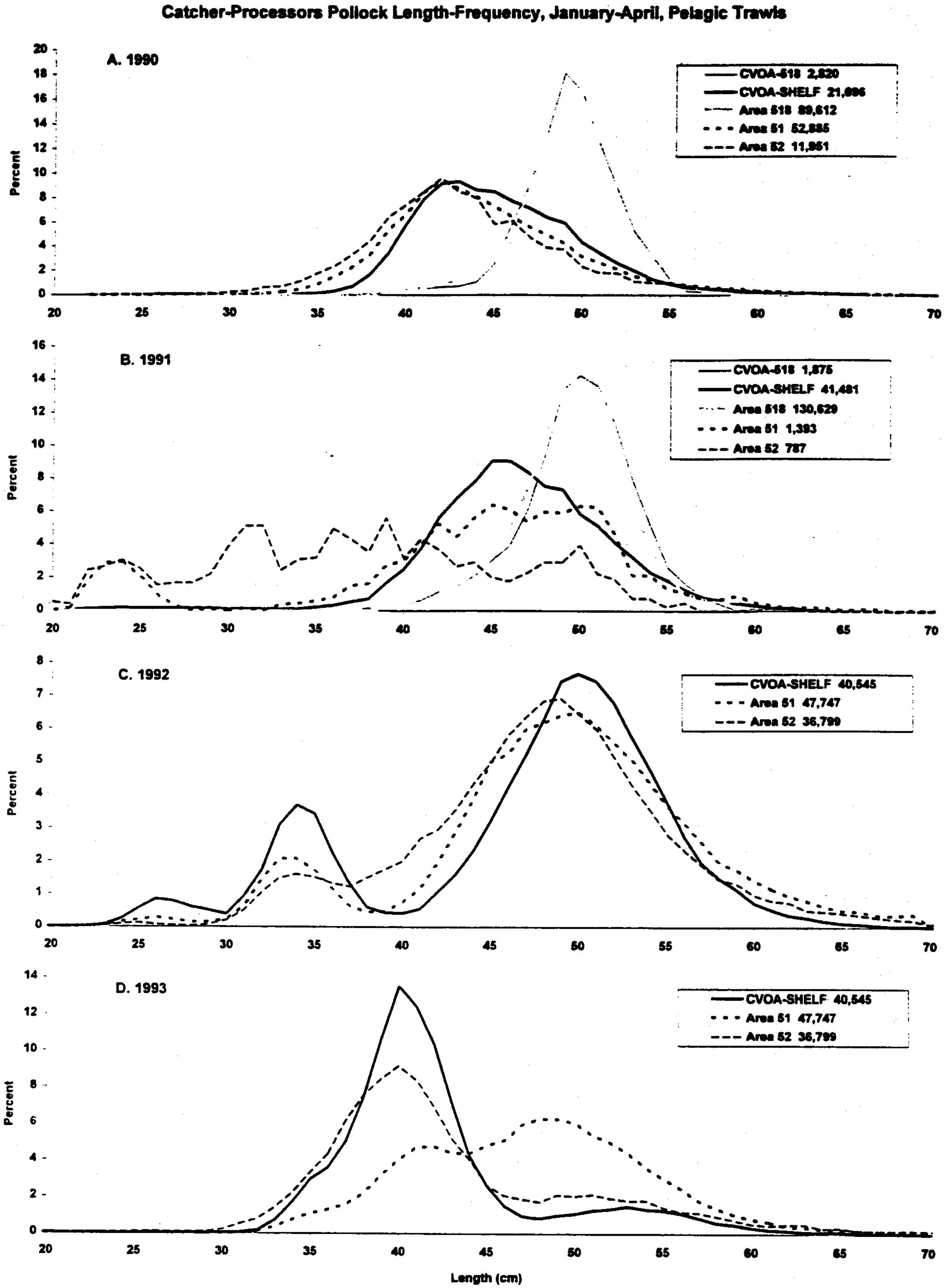


Figure 3-15. Pollock length-frequencies from observer samples aboard catcher boats in the eastern Bering Sea in January-April, 1990-93. Only pelagic trawl data are shown. See Figure 3-13 for areas. Sample sizes are shown in legend.

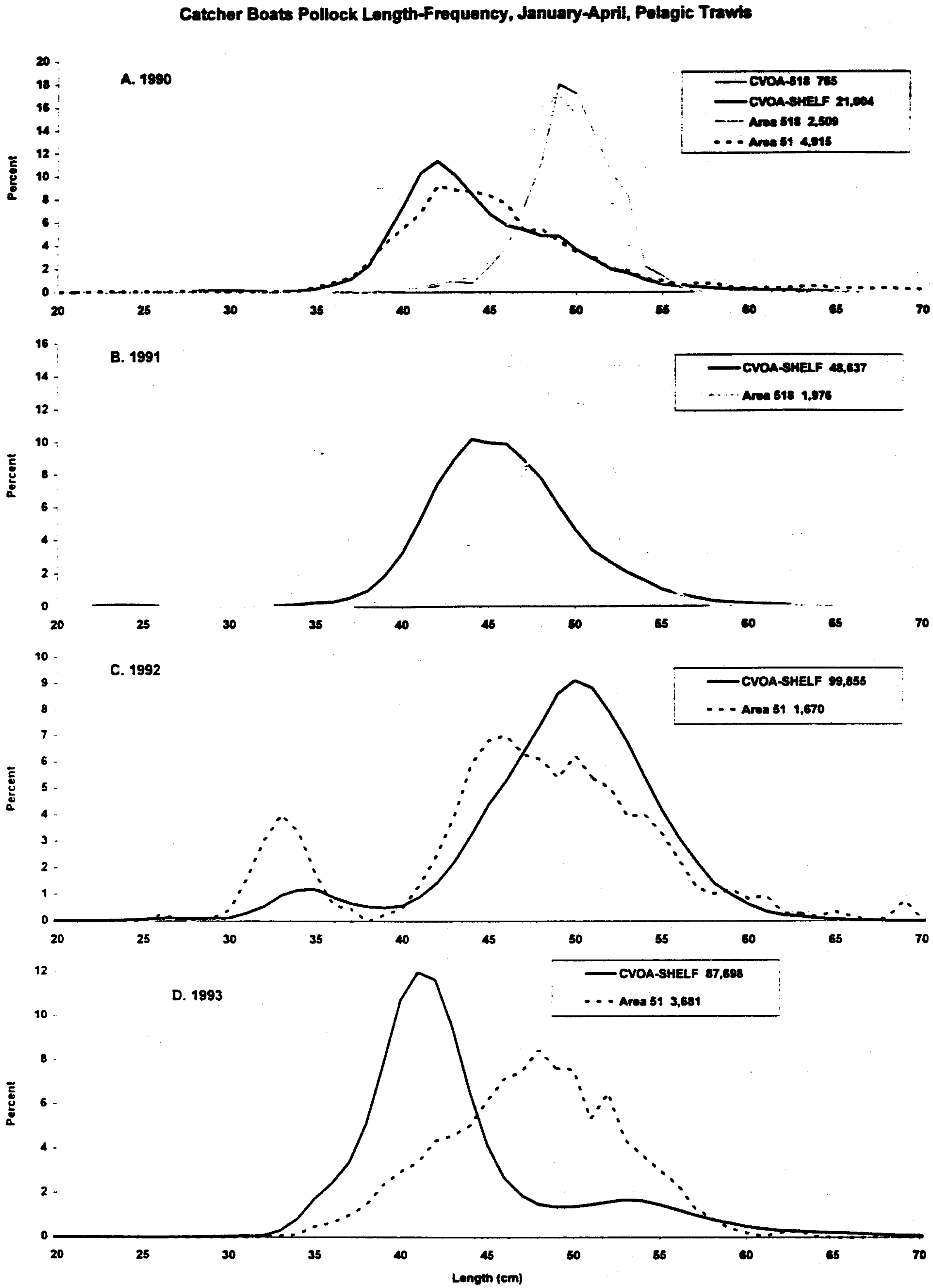
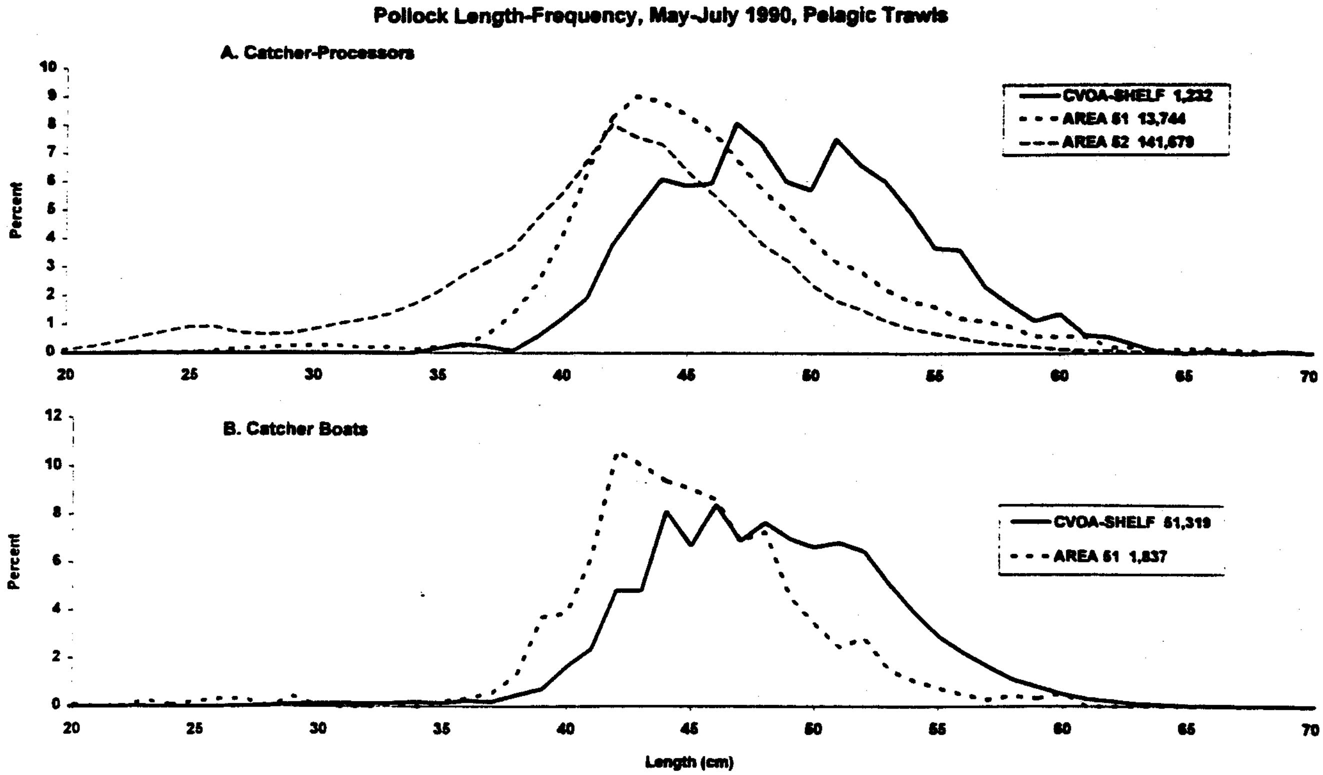


Figure 3-16. Pollock length-frequencies collected aboard catcher-processors (A) and catcher boats (B) in May-July (top) and August-December (bottom) 1990. Only pelagic trawl data are shown; see Figure 3-13 for areas. Sample sizes are in legend.



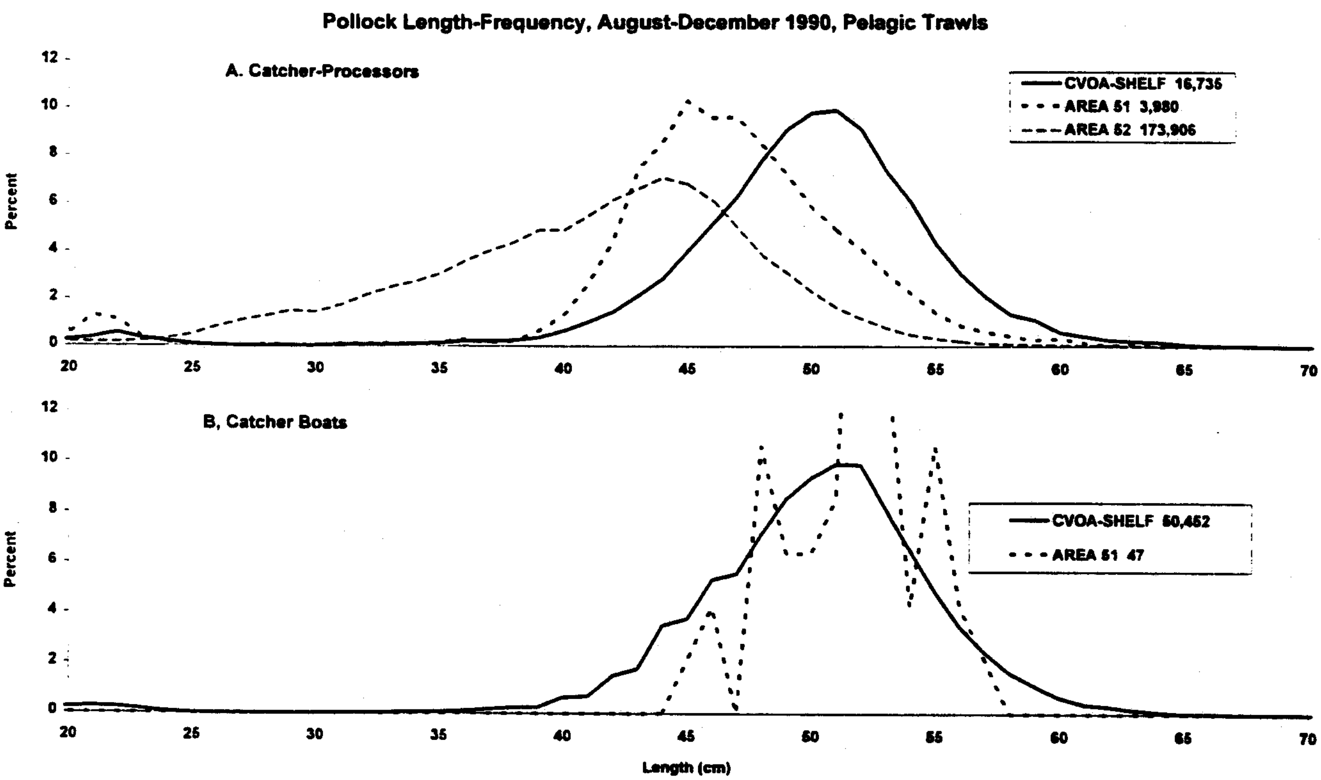
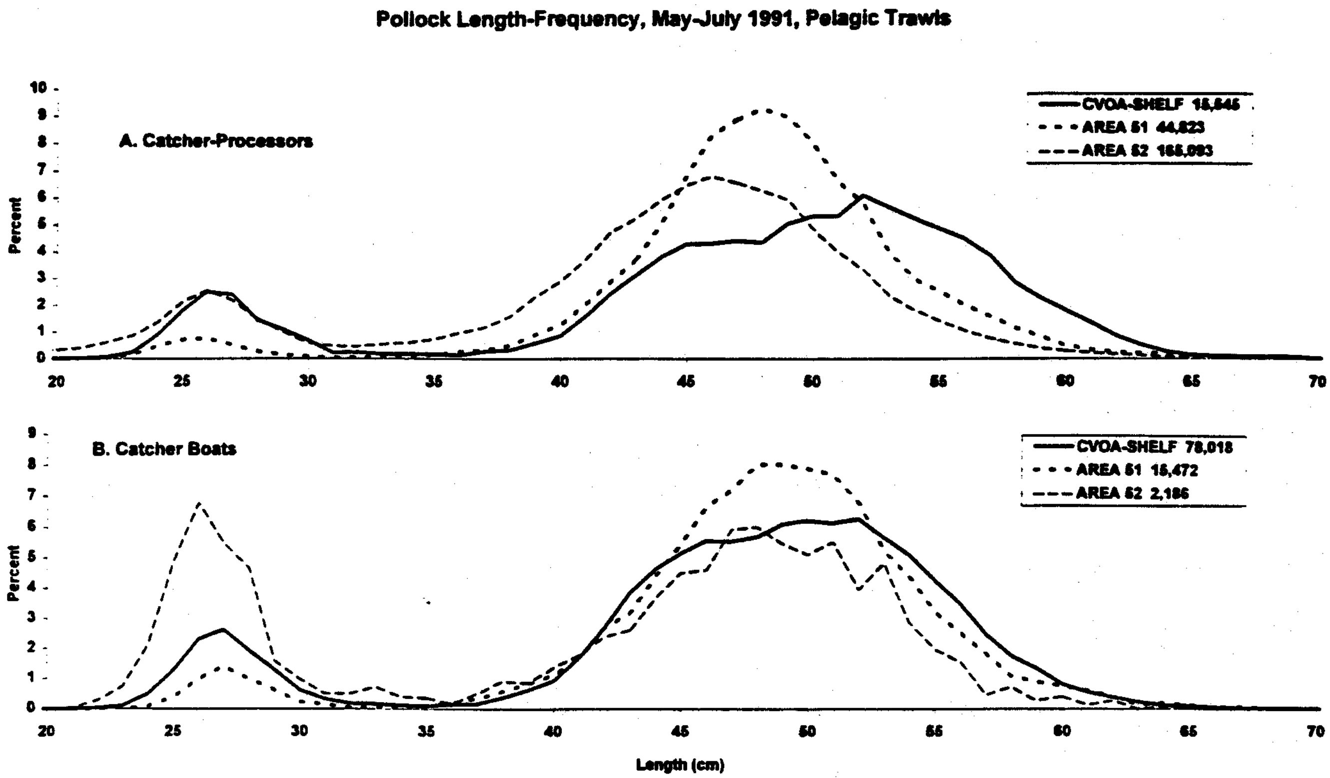


Figure 3-17. Pollock length-frequencies collected aboard catcher-processors (A) and catcher boats (B) in May-July (top) and August-December (bottom) 1991. Only pelagic trawl data are shown; see Figure 3-13 for areas. Sample sizes are in legend.



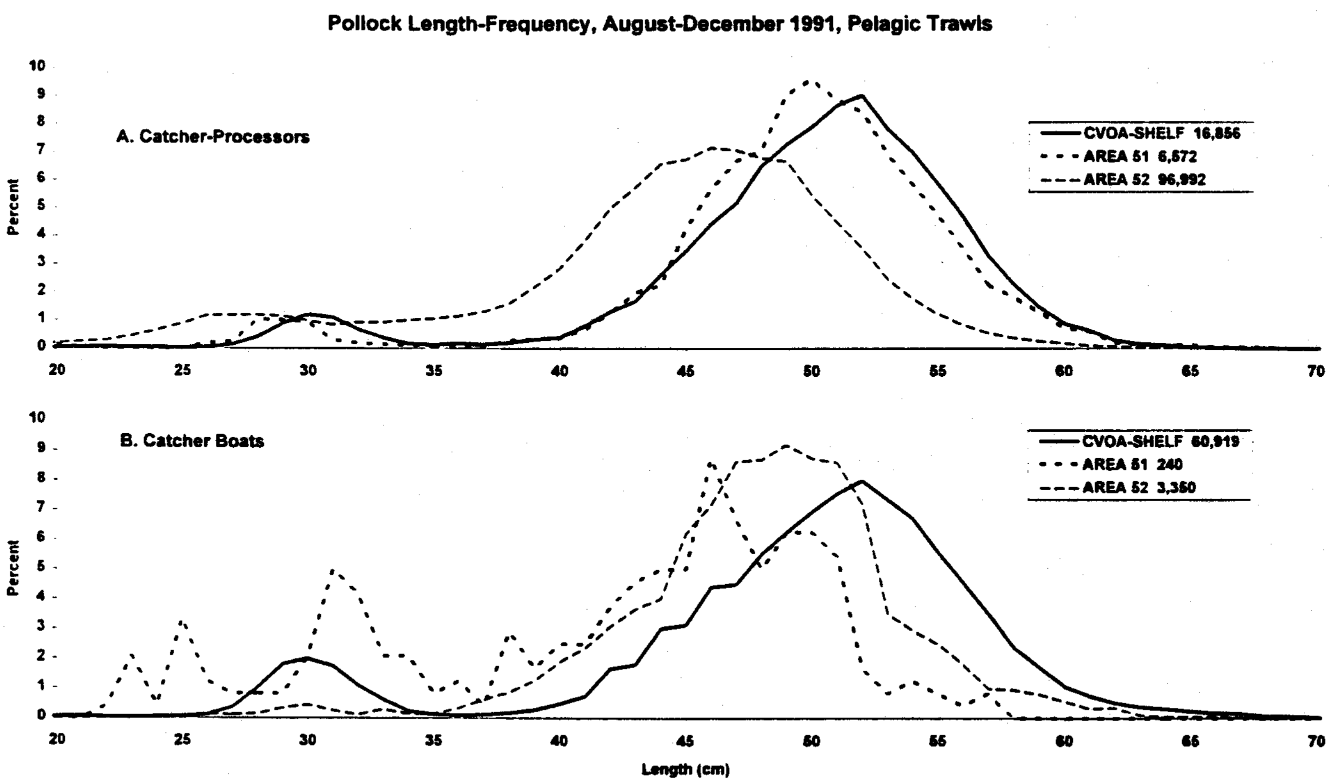
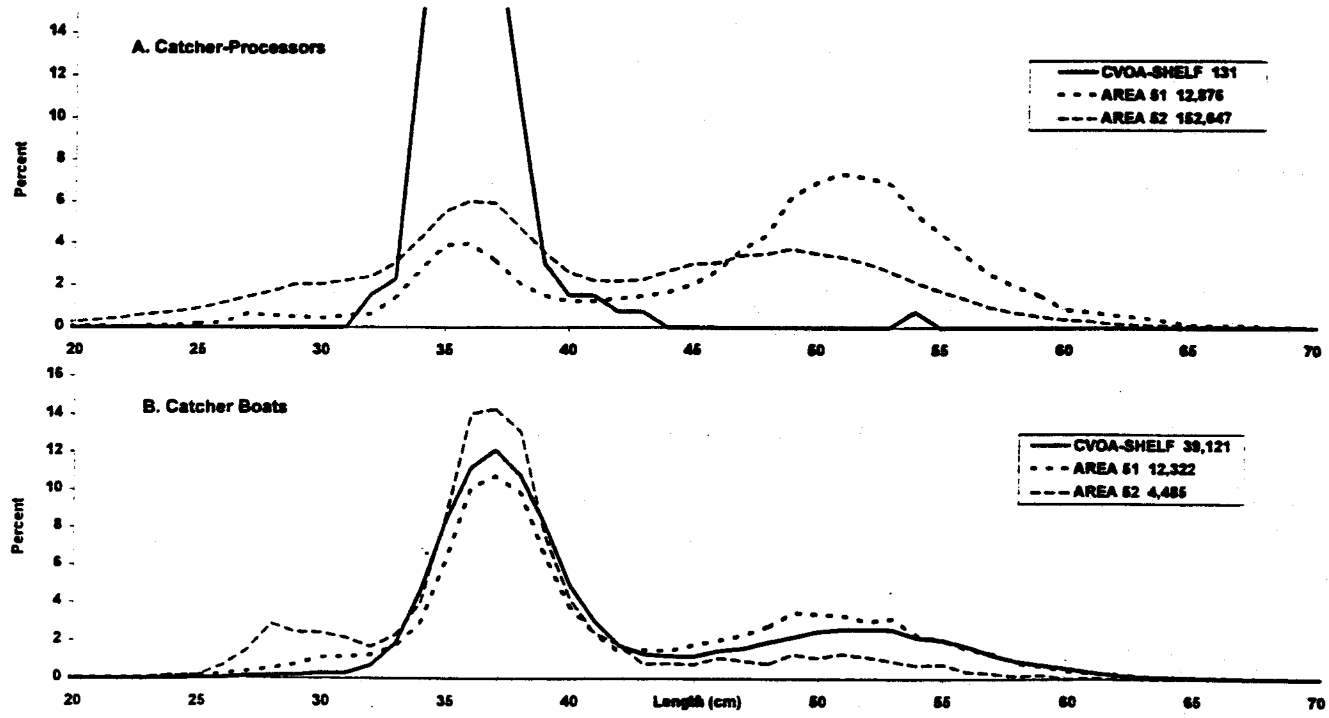


Figure 3-18. Pollock length-frequencies collected aboard catcher-processors (A) and catcher boats (B) in May-July (top) and August-December (bottom) 1992. Only pelagic trawl data are shown; see Figure 3-13 for areas. Sample sizes are in legend.

Pollock Length-Frequency, May-July 1992, Pelagic Trawls



Pollock Length-Frequency, August-December 1992, Pelagic Trawls

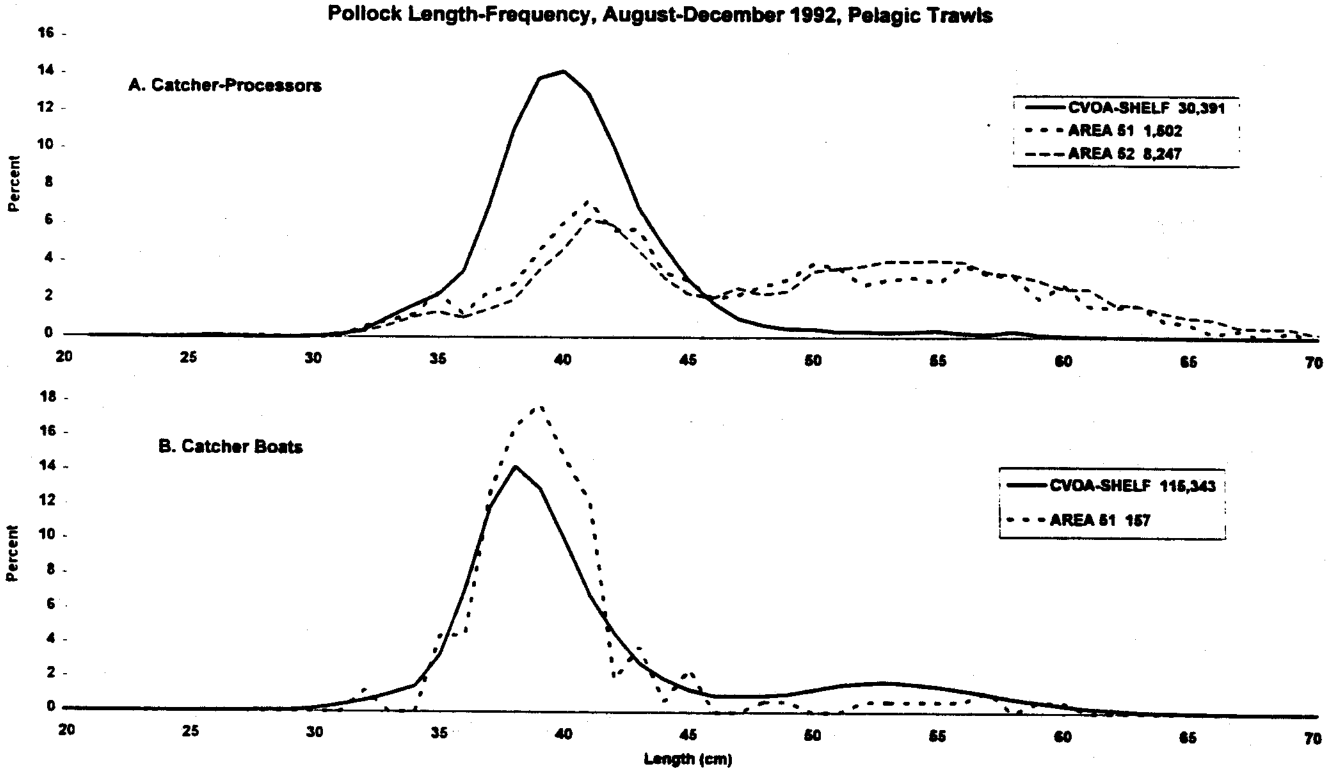
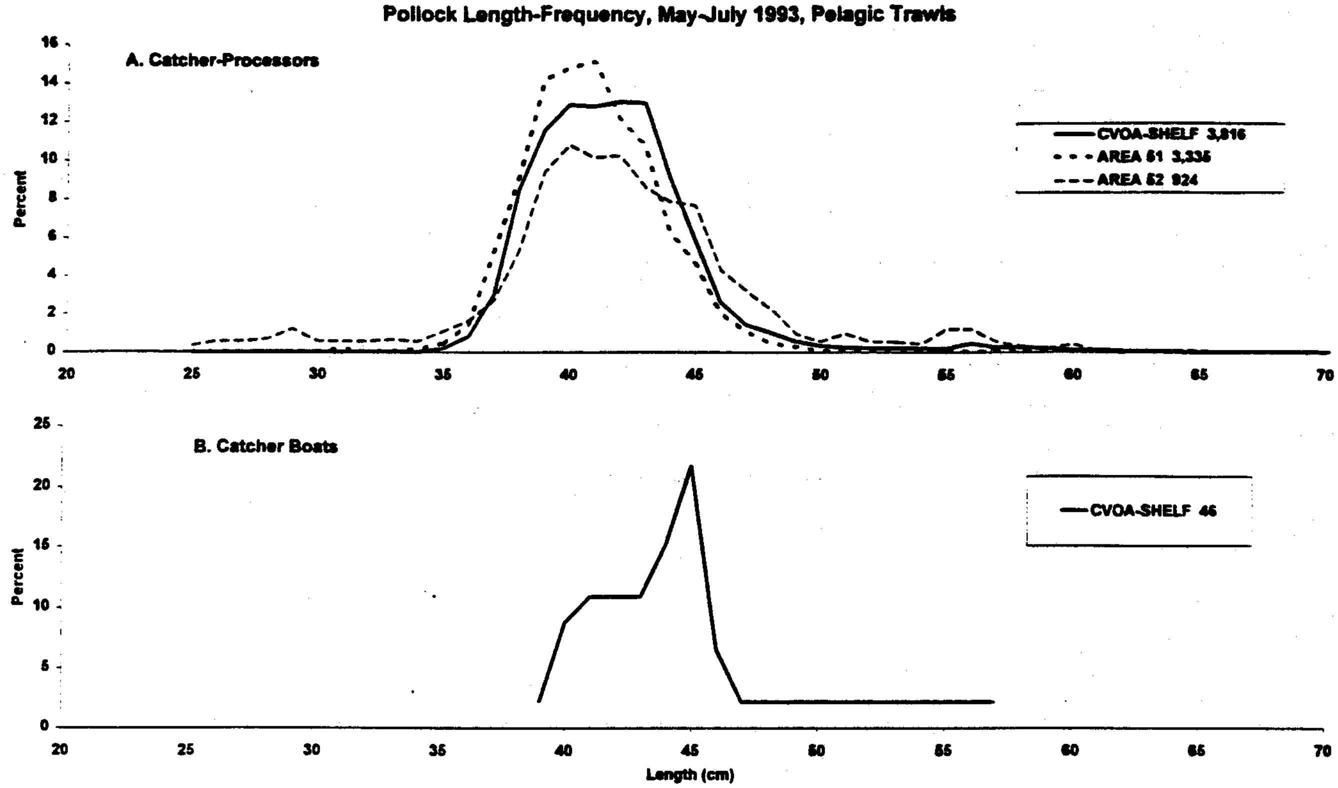
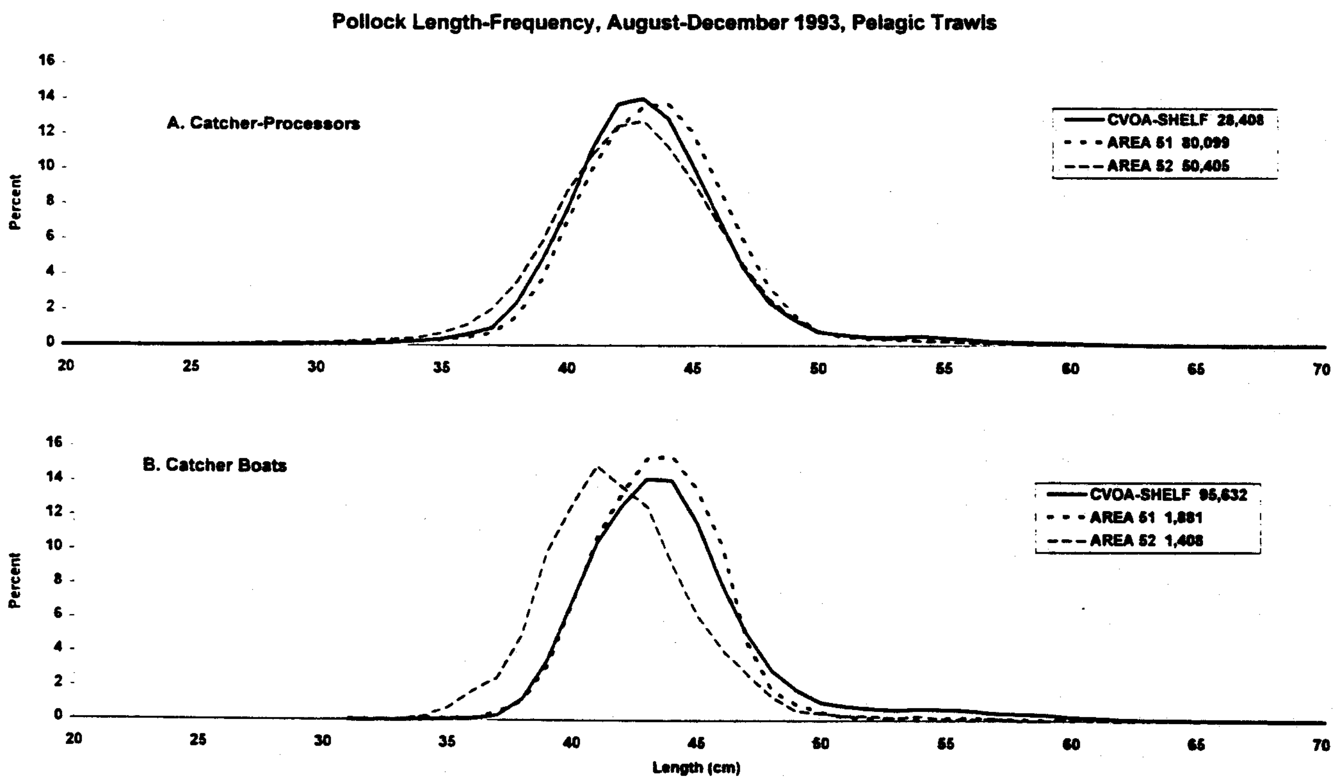


Figure 3-19. Pollock length-frequencies collected aboard catcher-processors (A) and catcher boats (B) in May-July (top) and August-December (bottom) 1993. Only pelagic trawl data are shown; see Figure 3-13 for areas. Sample sizes are in legend.





3.3 BYCATCH OF PROHIBITED SPECIES (SURVEYS AND FISHERY) AND FISHERY POLLOCK CPUE

3.3.1 Distribution of Halibut, Red King Crab, and Bairdi Tanner Crab from Surveys

Bottom trawl surveys in 1990-94 have shown that halibut are distributed primarily along the inner and outer shelf regions, with centers of abundance occurring south and east of Nunivak Island, around the Pribilof Islands, and within the CVOA (Figures 3.20-3.24). Mean survey CPUE within the CVOA has also been higher than areas 51 or 52 in 4 of the last 5 years (all but 1991; Table 3.5).

Red king crab have declined in abundance recently, necessitating the creation of a red king crab savings area (trawl exclusion zone) in Bristol Bay (see Appendix 1). In the last 5 years, red king crab have been caught in bottom trawl surveys only in Bristol Bay northeast of the CVOA (where the savings area is located) and around the Pribilof Islands (Figures 3.25-3.29); there has been little or no catch of red king crab in the CVOA in the bottom trawl surveys of 1990-94 (Table 3.5). Furthermore, in areas outside of the CVOA, there are large areas in areas 52 and 51 where 30+ cm pollock abundance is high and red king crab abundance is low.

Tanner (Bairdi) crab are widely distributed in the middle and outer shelf regions of the Bering Sea, with centers of abundance in Bristol Bay to Unimak Island (including the CVOA) and around the Pribilof Islands (Figures 3.30-3.34). Survey mean Tanner crab CPUE's have been highest inside the CVOA in each of the last 5 years, second highest in area 51 outside the CVOA, and lowest in area 52 (Table 3.5). This ranking is due primarily to inclusion of many stations along the inner shelf in both areas 51 and 52 where no Tanner crab were caught, while Tanner crab were caught at almost every station on the outer shelf each year inside the CVOA.

3.3.2. Pollock Fishery CPUE and Prohibited Species Bycatch

3.3.2.1 Extension of Nelson/Berger Analysis from Supplementary Analysis of CVOA

In the original environmental assessment of BSAI FMP Amendment 18 (Supplementary Analysis section 4.3.3.2), pollock catch per unit effort and prohibited species bycatch rates of individual vessels fishing in different areas in the same quarter were compared (Nelson/Berger analysis). In this re-analysis of the effects of the CVOA, the Nelson/Berger analysis was extended (with slight modifications) through 1993. Their analysis looked at catch rates of pollock and prohibited species by individual vessels fishing in the same quarter (quarters 1-3) and year (1990 and 1991) both inside and outside the CVOA. In general, average CPUE of pollock was greater outside the CVOA than inside (except for the second quarter in 1990), and bycatch rates of herring and salmon were higher in the CVOA than outside the area. During the first quarters (A-seasons) of both 1990 and 1991, pollock catch rates were higher outside the CVOA in the Bogoslof district. The Bogoslof district was closed to directed pollock fishing beginning in 1992 (also when the Inshore/Offshore allocations began). There was no trend in the halibut bycatch rates with respect to the area. The Nelson/Berger analysis used data from prior to the establishment of the inshore/offshore allocation and the CVOA.

For 1992 and 1993, data on pollock and prohibited species bycatch of catcher/processors (C/P), motherships (MS) and inshore catcher boats (CB) that fished both inside and outside of the CVOA in the same quarter were compared. Four changes in methodology from the Nelson/Berger analysis were made: (1) individual vessels had at least 10 sampled hauls in each area to be utilized (as compared with 30 in Nelson/Berger), (2) only pelagic trawl data were utilized, (3) additional areas were defined, and (4) data from quarter 1 (A-season) were excluded.

Gear was defined as a classification variable because of the differences in catch rates of pollock and prohibited species between pelagic and bottom trawls (Norris et al. 1991a,b). Once gear was defined, it was found that very few vessels had as many as 30 sampled hauls inside and outside of the CVOA in a given quarter; consequently, the minimum number of sampled was hauls was reduced to 10 to increase the number of vessels for the comparison.

Areas defined in this analysis are shown in Figure 3.13. These were defined for two reasons. First, statistical reporting area 518, the Bogoslof district, was closed beginning in 1992. This also closed the southwestern portion of the CVOA which had been fished for pollock primarily during the A season (CVOA-518). Consequently, since only the shelf portion of the CVOA (CVOA-SHELF) was open to directed pollock fishing, this area was defined separately. Secondly, pollock northwest of the Pribilof Islands are generally smaller at age and the population composed of younger fish than those on the southeast shelf between the Pribilofs and Unimak Island (including inside the CVOA). Because of this, it would not be appropriate to lump all areas outside of the CVOA for comparison of pollock CPUE and other data with the CVOA. The area outside of the CVOA was divided east and west of 170°W longitude, or the boundary of INPFC areas 51 and 52. AREA 51 contains all the area outside of the CVOA and the Bogoslof district (518) in INPFC area 51; AREA 52 is the entire INPFC area 52.

Only data from July-December (quarters 3 and 4) 1992 and 1993 were included in this analysis. Since offshore processors can use the CVOA during the A season, there was no reason to include this time of year in the analysis. Furthermore, under the alternative considered in this analysis, the inshore processing sector has exclusive use of the CVOA only during the pollock B-season. There were no data available for comparison in quarters 2 of both 1992 and 1993. In 1992, the B-season began June 1, but there were no vessels that fished both inside and outside the CVOA during the second quarter due to the exclusion of the offshore sector from the CVOA and the voluntary delay by the inshore sector of the start of their B-season (until July) due to large numbers of small pollock in the CVOA. In 1992, the offshore sector's B-season closed on July 28, while the inshore sector's B-season remained open until September 22. The 1992 CDQ fishery occurred in December. In 1993, the B-season did not begin until August 15, and lasted until September 22 for the offshore sector and October 3 for the inshore sector. The 1993 CDQ fishery occurred both before and after the B-season.

In 1992, 8 vessels had at least 10 sampled hauls per quarter in areas both inside and outside the CVOA (Table 3.6). In quarter 3, 5 inshore catcher boats fished in both the CVOA and in area 51 outside the CVOA. Three of these had equivalent or slightly lower pollock CPUEs in the CVOA than outside, while the remaining two had CPUEs 2-3 times greater inside the CVOA than outside. Salmon bycatch rates were higher inside the CVOA for 3 of the 5 vessels, averaging almost 0.8 salmon per mt pollock for one vessel. There was no trend in halibut, crab or herring bycatch rates with respect to location fished. In quarter 4, only 3 catcher/processors fished both inside and outside the CVOA. Since the offshore pollock's B-season closed on July 28, this data is all from the CDQ fishery which took place in December. CPUE was greater inside the CVOA than outside since pollock were probably concentrating on the southeastern shelf in preparation for spawning. There were no clear areal trends with respect to bycatch of prohibited species at this time.

In 1993, 14 vessels had at least 10 sampled hauls per quarter in areas both inside and outside the CVOA (Table 3.6). From July-September (quarter 3), 8 catcher/processors, 2 motherships and 1 catcher boat fished in both the CVOA and areas outside. The catcher/processors fished in the CVOA prior to the start of the B-season (on August 15) as part of the CDQ fishery. Six of these had higher CPUEs inside the CVOA than outside (either or both Areas 51 and 52), while only 2 had higher CPUEs outside the CVOA. Similarly, 2 out of the 3 motherships and catcher boats had higher CPUEs inside the CVOA than outside. Generally, pollock CPUE was highest inside the CVOA, second highest in Area 51 outside the CVOA, and lowest in Area 52 in quarter 3, 1993. Salmon bycatch rates were higher in the CVOA than outside for 9 of the 11 vessels in quarter 3; in one case, salmon bycatch rates were almost 2 salmon/mt of pollock caught in the CVOA compared with 0.03 salmon/mt pollock in Area 52. There were no trends for herring, halibut or crab bycatch rates with respect to area fished in quarter 3, 1993. In quarter 4, 2 out of the 3 catcher/processors that fished in the CVOA and in Area 52 had greater pollock CPUE inside the CVOA, while all three had higher salmon bycatch rates inside the CVOA.

Salmon bycatch rates in quarter 4 were generally lower than those in quarter 3, and there was little or no herring or crab bycatch in quarter 4.

In summary, pollock CPUE using pelagic trawls was generally higher inside the CVOA than outside during the 1992 and 1993 B-seasons and CDQ fisheries. The areal trend was stronger in 1993 than in 1992, probably due to movement of the 1989 year-class to the area as it aged one year. Salmon bycatch rates were also higher inside the CVOA than outside, while there were no clear trends in other prohibited species bycatch rates.

3.3.2.2 Norris (1992) Analysis of CPUE and Bycatch Data from 1981-90 Pollock Fisheries

Norris (1992) summarized all pollock fishery observer data collected aboard foreign, joint-venture and domestic vessels (excluding motherships) from 1981-90 with respect to pollock CPUE and bycatch rates of prohibited species inside and outside of the CVOA. The area inside the CVOA did not include that shared with the Bogoslof district (CVOA-518 in Figure 3.3), while the area outside the CVOA included the Aleutian Islands district (Area 540) but not statistical areas 512, 514, and 516 where little directed pollock fishing occurs. These data are fleet averages and do not account for differences in vessel capacity, but are separated by gear type (bottom and midwater) based on catch composition. Averages across all year (1981-90) and fisheries (foreign, joint-venture and domestic) for quarters 2-4 are listed in Table 3.7. In general, bottom trawl fisheries had higher pollock CPUEs and higher bycatch rates of prohibited species inside the CVOA than outside. Instances where bottom trawl bycatch rates were considerably greater inside than outside the CVOA were: quarter 3, other salmon bycatch rates; quarter 3, herring bycatch rate; quarters 2-4, red king crab and halibut bycatch rates. In quarter 4, herring bycatch rates were higher outside the CVOA than inside, reflecting the offshore migration of herring during the winter.

Midwater pollock fisheries had greater pollock CPUE inside the CVOA only during the second quarter, but were similar to bottom trawl fisheries in that other salmon and herring bycatch rates in quarter 3 were much greater inside than outside the CVOA. Also similar to the bottom trawl pollock fishery, herring bycatch rates were higher outside the CVOA than inside in quarter 4. Average bycatch rates of crabs and halibut by midwater pollock fisheries were too low and variable to note any trend with respect to area.

3.3.2.3 Summaries of Pollock CPUE by Gear, Zone, Processor Type, Season

Table 3.8 contains summaries of pollock CPUE data collected by observers in 1990-93. Two types of mean CPUE were computed for each gear (pelagic and bottom trawls), zone (see Figure 3.13), processor type (catcher-processors and catcher boats only), and season (A, B and CDQ): Grand Mean = total pollock caught divided by total hours in each gear, zone, processor type, season cell; and the mean of the individual haul CPUEs in each cell.

In 1990, catcher-processors caught 95% of their B-season pollock in area 52, and their pollock CPUE was also higher there than either area 51 or the CVOA-Shelf. By contrast, catcher boats for inshore processors caught almost 100% of their B-season pollock within the CVOA-Shelf, where their grand mean midwater trawl CPUE (8.1 mt/hr) was about the same as the catcher processors in the same zone (8.7 mt/hr). Catcher boats fished primarily in the center of the CVOA, in the area north of Akutan and Akun Islands north and west of Unimak Pass, and along the 200 m isobath.

The pattern of B-season pollock fishing in 1991 was similar to 1990, where catcher processors fished primarily in area 52 (83% of their catch), while catcher boats fished primarily in the CVOA-Shelf (84% of their catch). In the same areas, catcher processors and catcher boats had similar grand mean midwater pollock CPUEs: in area 52, catcher processors had a mean of 14.1 mt/hr, while catcher boats had 15.5 mt/hr; in CVOA-Shelf, catcher processors had a mean of 4.8 mt/hr, while catcher boats had 4.9 mt/hr, considerably lower than in 1990.

1992

In 1992, the CVOA first became enforced during the B-Season (which began 1 June). Catcher processors continued the pattern they exhibited during the previous two years and caught the vast majority of the B-season pollock in area 52 (95%), and the remainder in area 51 east of the Pribilof Islands. Similarly, catcher boats continued their pattern of B-season harvest, catching 93% of their pollock within the CVOA-Shelf. Catcher boats fished the same area on the CVOA-shelf that they had used in 1990 and 1991, which was basically a Y-shaped area extending northeast on the shelf from Akutan Island to north of Unimak Island, and the other branch from the Horseshoe area northwest along the 200 m isobath. The north-central area and the eastern quarter of the CVOA were not utilized by inshore catcher boats for midwater pollock fishing. The CVOA did not significantly alter fishing patterns for either sector in 1992 compared to both 1990 and 1991.

Catcher boats fished for pollock in a large number of places in Area 51, and did not fish to any great degree east of the Pribilofs where the catcher processors were. Taken in aggregate, however, catcher boats had a lower grand mean midwater pollock CPUE in area 51 (5.4 mt/hr) than did catcher processors (8 mt/hr), but much better bottom pollock grand mean CPUE (12.1 mt/hr compared with 2.3 mt/hr). Catcher boat CPUE in the CVOA-Shelf was much higher in 1992 (13.0 mt/hr) than in either 1990 (8.1) or 1991 (4.9).

The CVOA was not enforced during the 1992 CDQ-season in December. However, catcher processors had much higher grand mean midwater pollock CPUEs on the CVOA-Shelf (23.3 mt/hr) than catcher boats (13.0 mt/hr), fishing in identical locations.

1993

In the 1993 B-season (which began 15 August), catcher-processors fished in much different areas than they had the previous three years. Area 51 provided about 65% of the catcher processor's B-season catch in 1993, while area 52 (chiefly in the area south of the Pribilof Islands) provided the remainder (35%). The areas fished by the offshore sector during the B-season reflected their desires to avoid the smaller members of the 1989 year-class, which dominated the fishery landings at this time throughout the eastern Bering Sea; smaller individuals of a pollock cohort are generally found north and west of the Pribilof Islands. Consequently, the offshore sector was "squeezed" during the B-season between the smaller pollock in area 52 and the northern and western boundaries of the CVOA. Most of the offshore sector's B-season landings came from an area only lightly exploited in previous years, located on the central shelf north of the CVOA (56°N) between 164-166°W (mostly west of the red king crab savings area). Grand mean midwater pollock CPUE for the offshore sector was slightly higher in area 51 (24.3 mt/hr) than 52 (20.5 mt/hr).

Catcher boats fished in 1993's B-season in basically the same manner as during the 1990-92 B-seasons, with 98% of their pollock landings coming from the CVOA-Shelf, where their mean CPUE was 18.4 mt/hr (the highest of the four 1990-1993 B-seasons). Catcher boat mean CPUE's in the two other areas had the same pattern as catcher processors (at a slightly lower level), with area 51 having a slightly higher grand mean midwater CPUE (21.3 mt/hr) than area 52 (17.0 mt/hr).

3.3.2.4 Summary of CPUE and Bycatch Rate data

As pointed out by Norris in the original supplementary analysis of the CVOA for Amendment 18, the lack of standardized sampling units in each time/area cell requires that the reader use caution in drawing conclusions from the fishery data and analysis presented by Norris (1992). As shown in the extension of the Nelson/Berger analysis, once it is stipulated that only individual vessels that had at least 10 sampled hauls in both areas in the same quarter, the universe of potential data for analysis is considerably smaller. However, even with these cautionary statements, it appears that some general conclusions can be made regarding pollock CPUE and bycatch rates of prohibited species by the fishery inside and outside of the CVOA from April-December:

a) based on the extension of the Nelson/Berger and Norris (1992) analyses, CPUE for pollock has generally been higher inside the CVOA than outside during quarters 2-4, but there is also considerable temporal/spatial variability in pollock CPUE. Analysis of fleet-wide 1990-93 B-season averages (catcher-processor and catcher boat), however, suggests that in most (1990-92) years, CPUE is greater in area 52 than to the southeast during the B-season, but can vary depending on the distribution of a dominant year-class (the 1989 year-class in 1993).

b) bycatch rates of herring and salmon have been higher inside the CVOA than outside, particularly from July-September;

c) bycatch rates of herring have been higher outside the CVOA from October-December;

d) bycatch rates of halibut by bottom trawls have been higher inside the CVOA than outside; and

e) bycatch rates of Tanner and red king crab were either higher or lower inside the CVOA than outside, depending on the fishery data set being analyzed. Recent information on distribution of these two species suggests that red king crab bycatch rates should be lower, and Tanner crab bycatch rates should be higher inside the CVOA than outside in areas frequented by pollock fisheries.

1990 Eastern Bering Sea Groundfish Survey
Pacific Halibut CPUE (kg/ha)

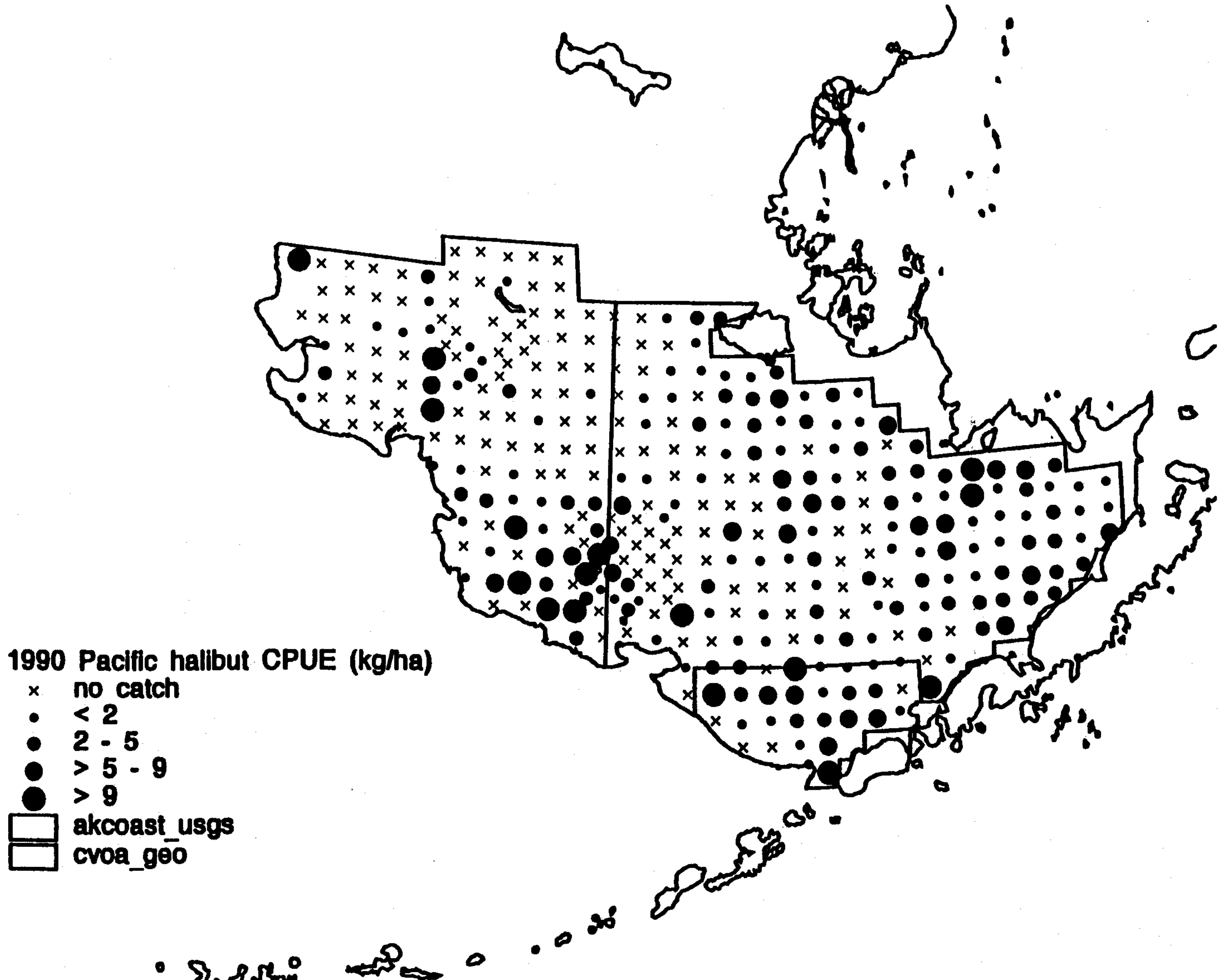


Figure 3-20. Haul-by-haul catch-per-unit-effort (CPUE=kg/hectare) of Pacific halibut from 1990 eastern Bering Sea groundfish bottom trawl survey.

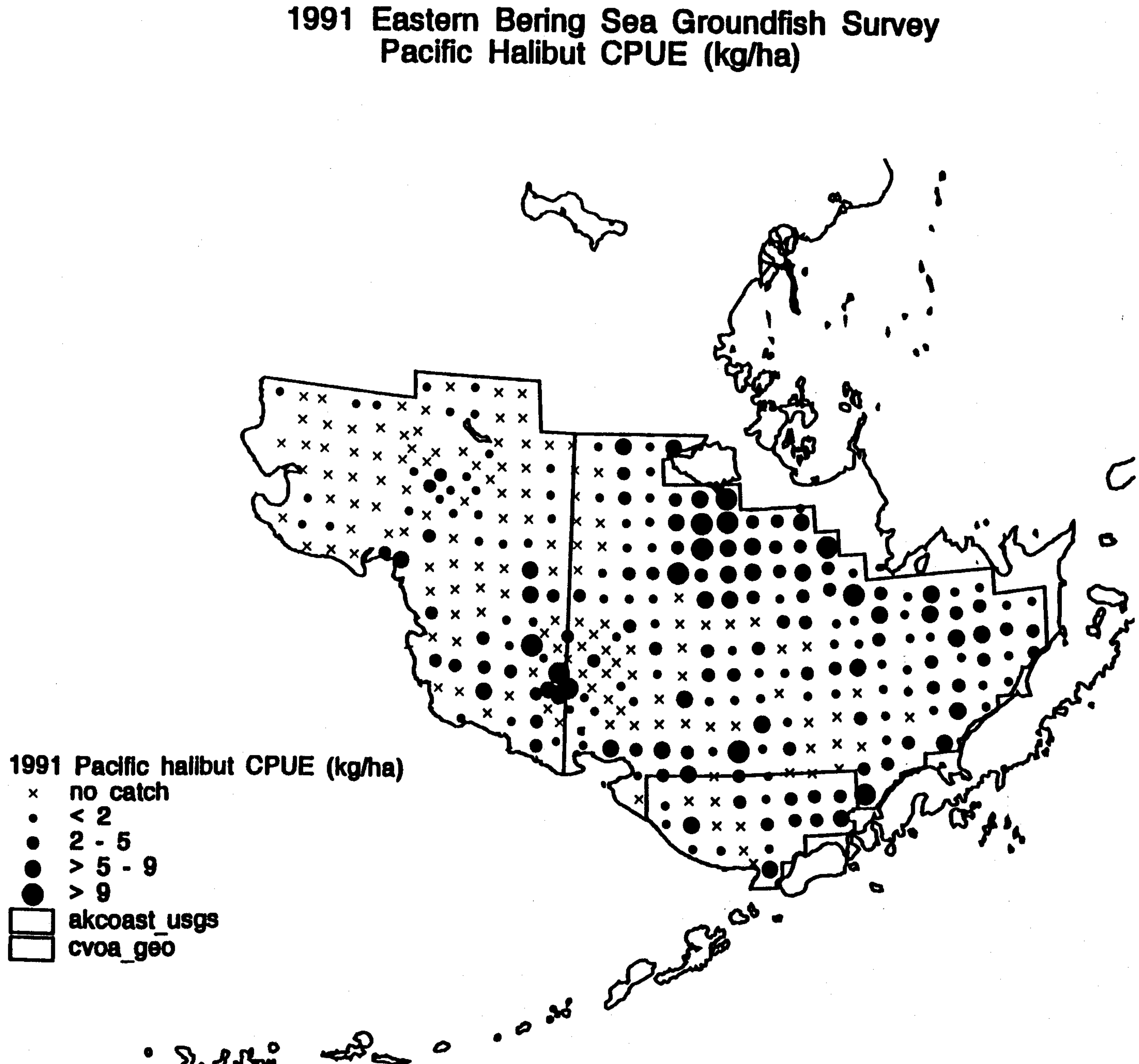


Figure 3-21. Haul-by-haul catch-per-unit-effort (CPUE=kg/hectare) of Pacific halibut from 1991 eastern Bering Sea groundfish bottom trawl survey.

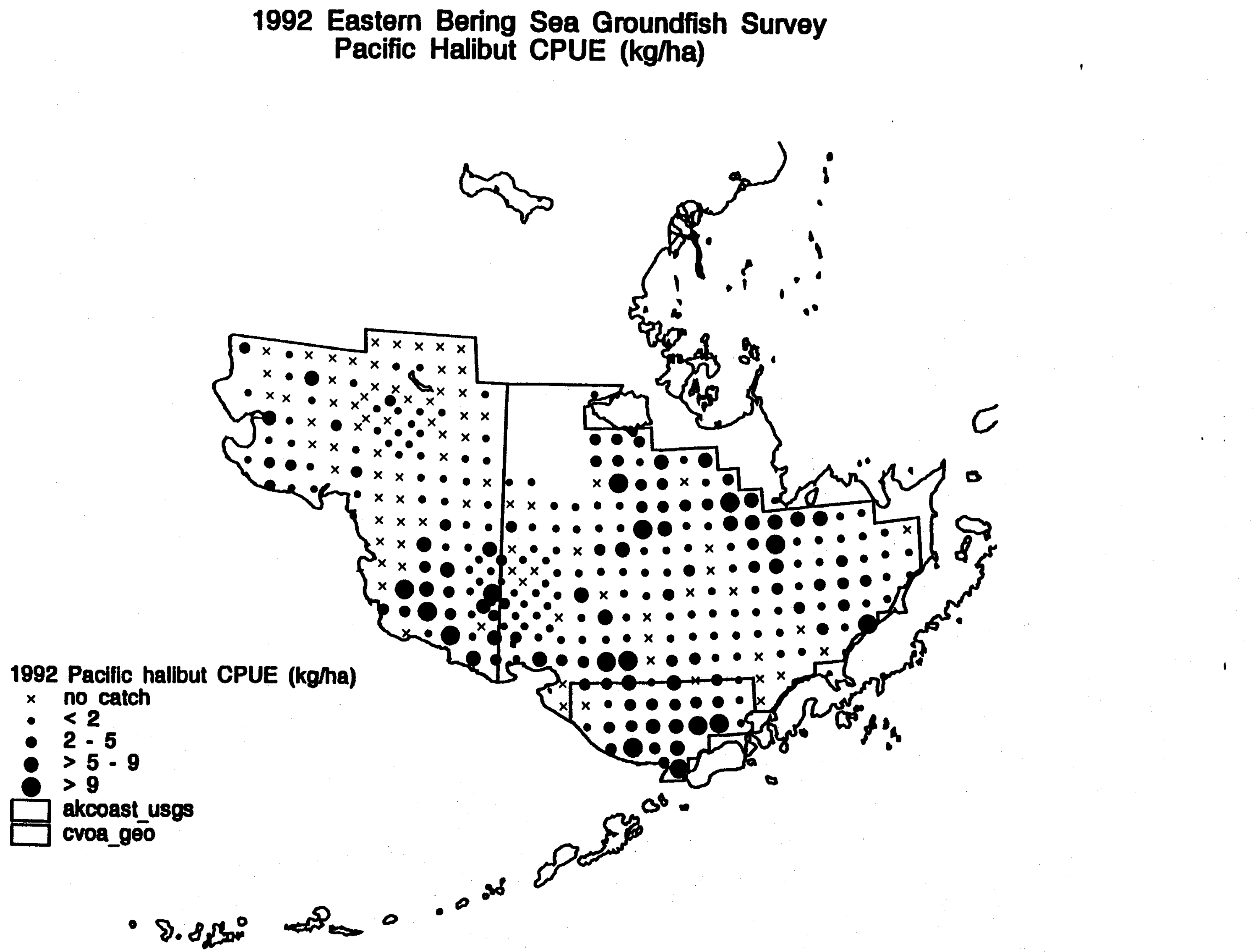


Figure 3-22. Haul-by-haul catch-per-unit-effort (CPUE=kg/hectare) of Pacific halibut from 1992 eastern Bering Sea groundfish bottom trawl survey.

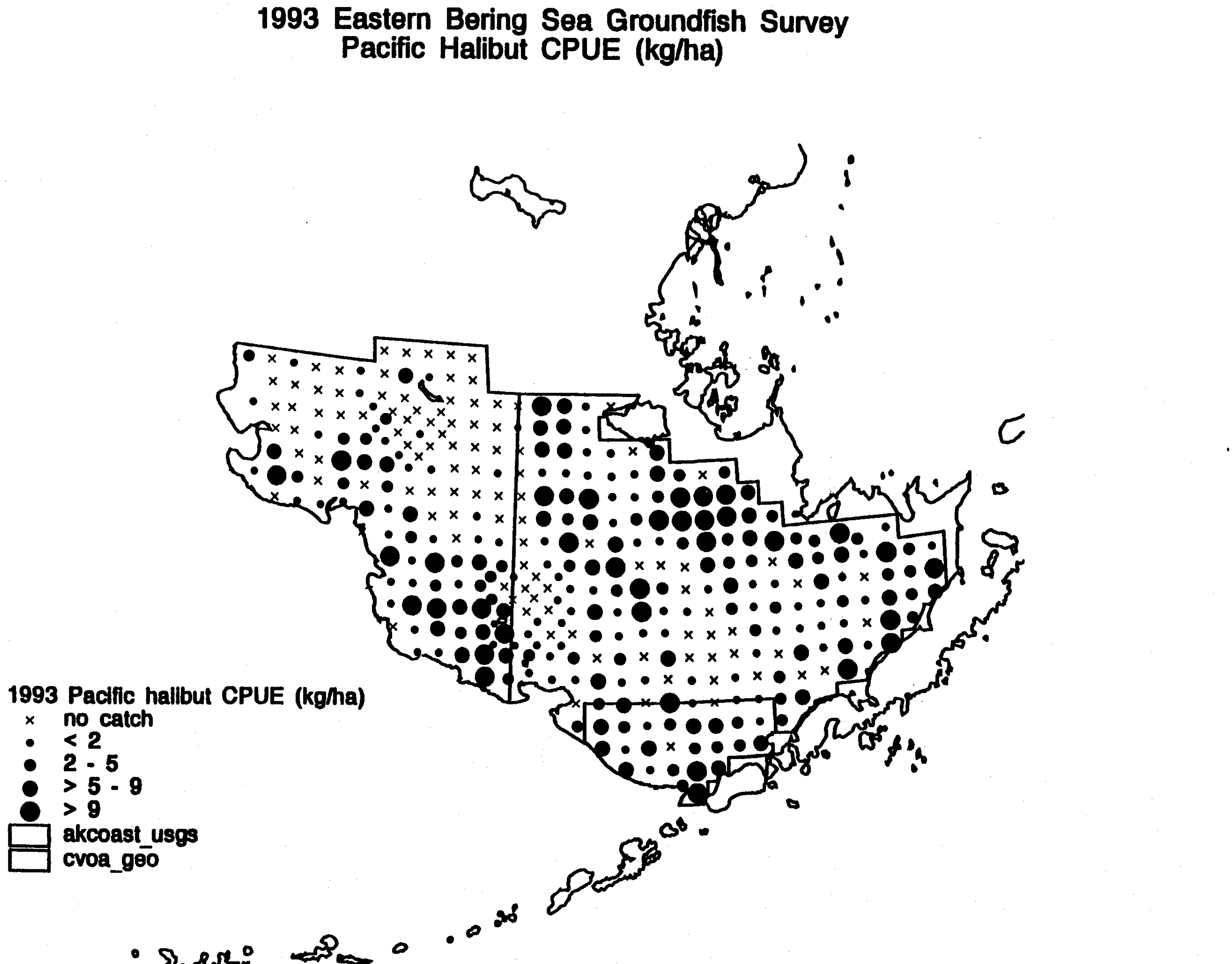


Figure 3-23. Haul-by-haul catch-per-unit-effort (CPUE=kg/hectare) of Pacific halibut from 1993 eastern Bering Sea groundfish bottom trawl survey.

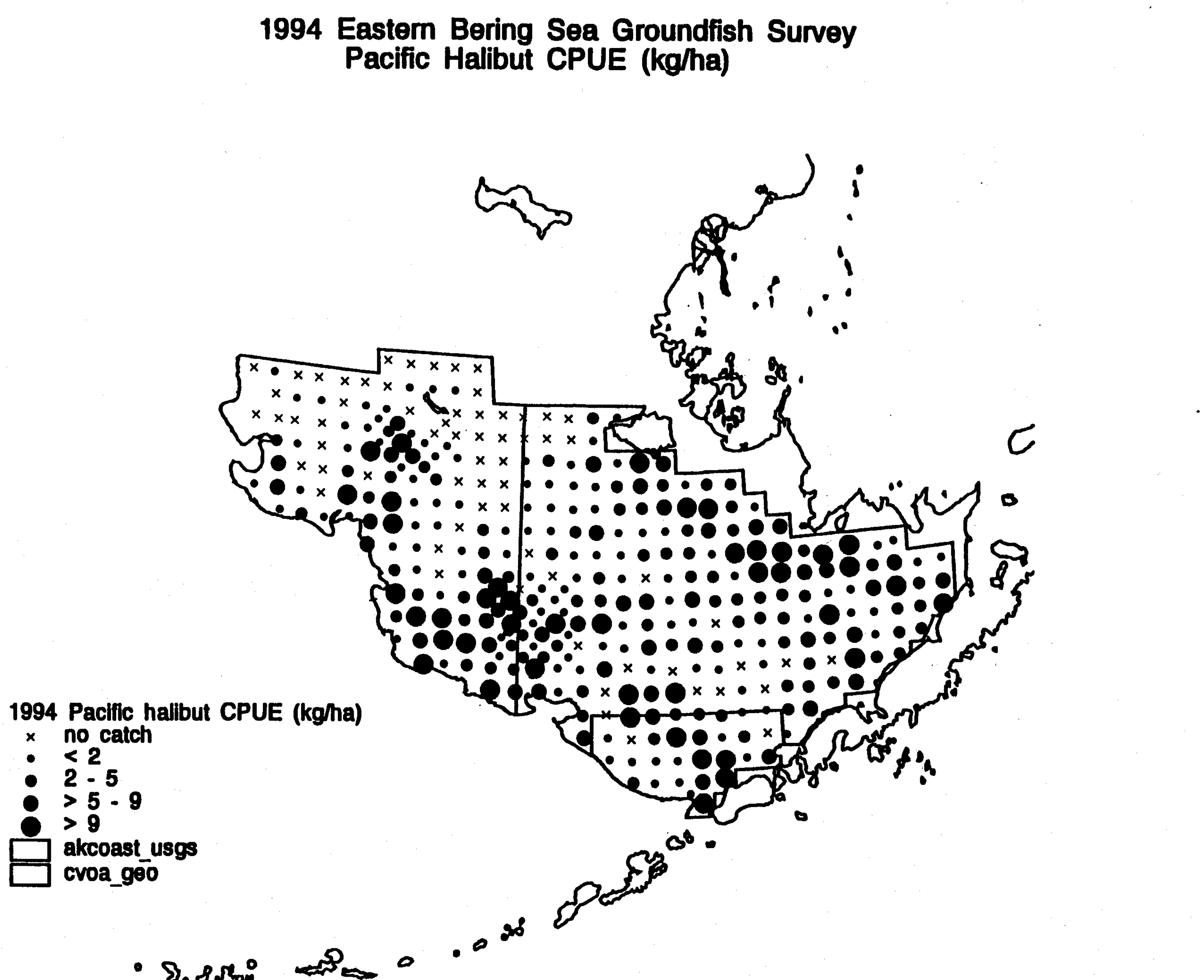


Figure 3-24. Haul-by-haul catch-per-unit-effort (CPUE=kg/hectare) of Pacific halibut from 1994 eastern Bering Sea groundfish bottom trawl survey.

1990 Eastern Bering Sea Groundfish Survey
Red King Crab CPUE (kg/ha)

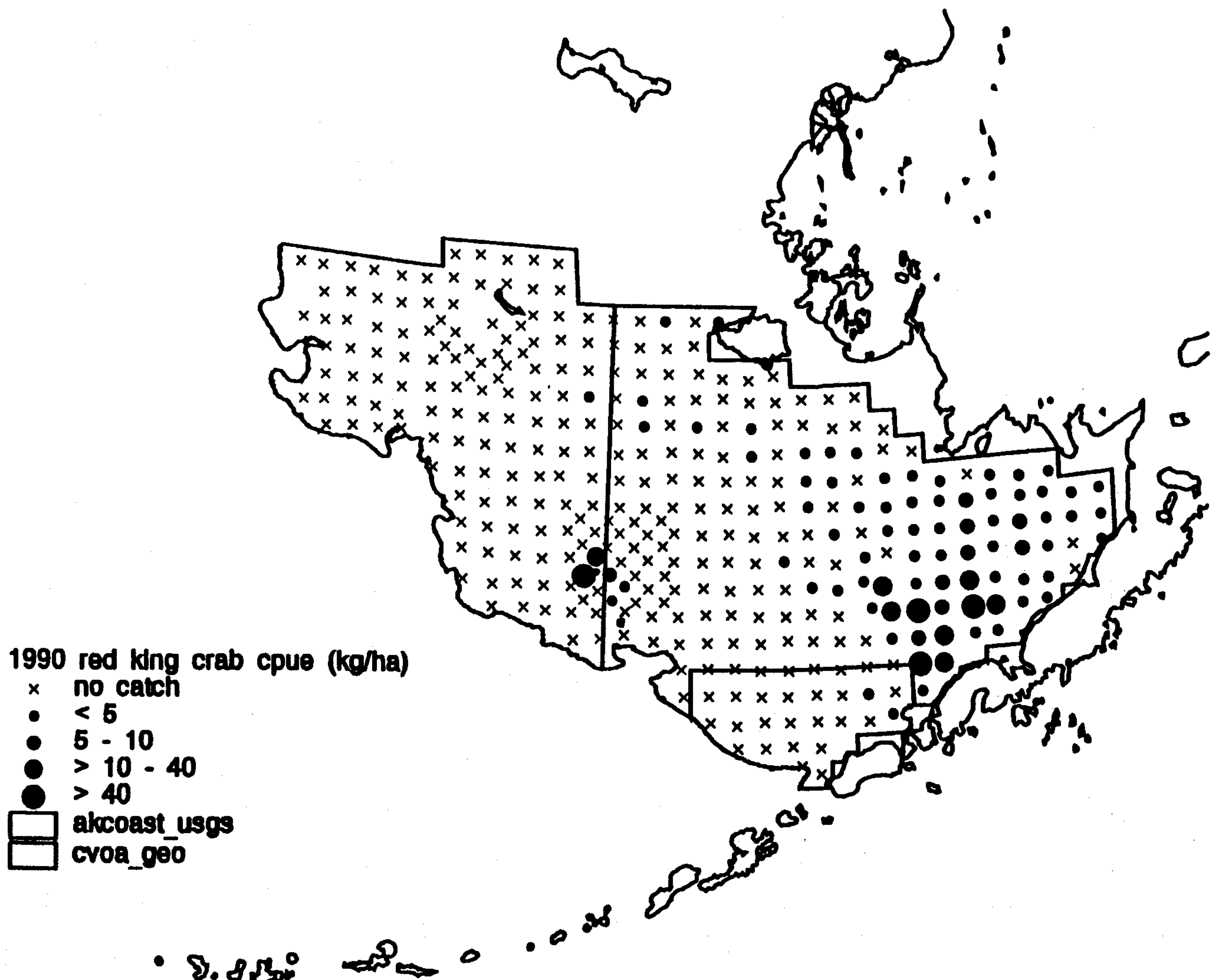


Figure 3-25. Haul-by-haul catch-per-unit-effort (CPUE=kg/hectare) of red king crab from 1990 eastern Bering Sea groundfish bottom trawl survey.

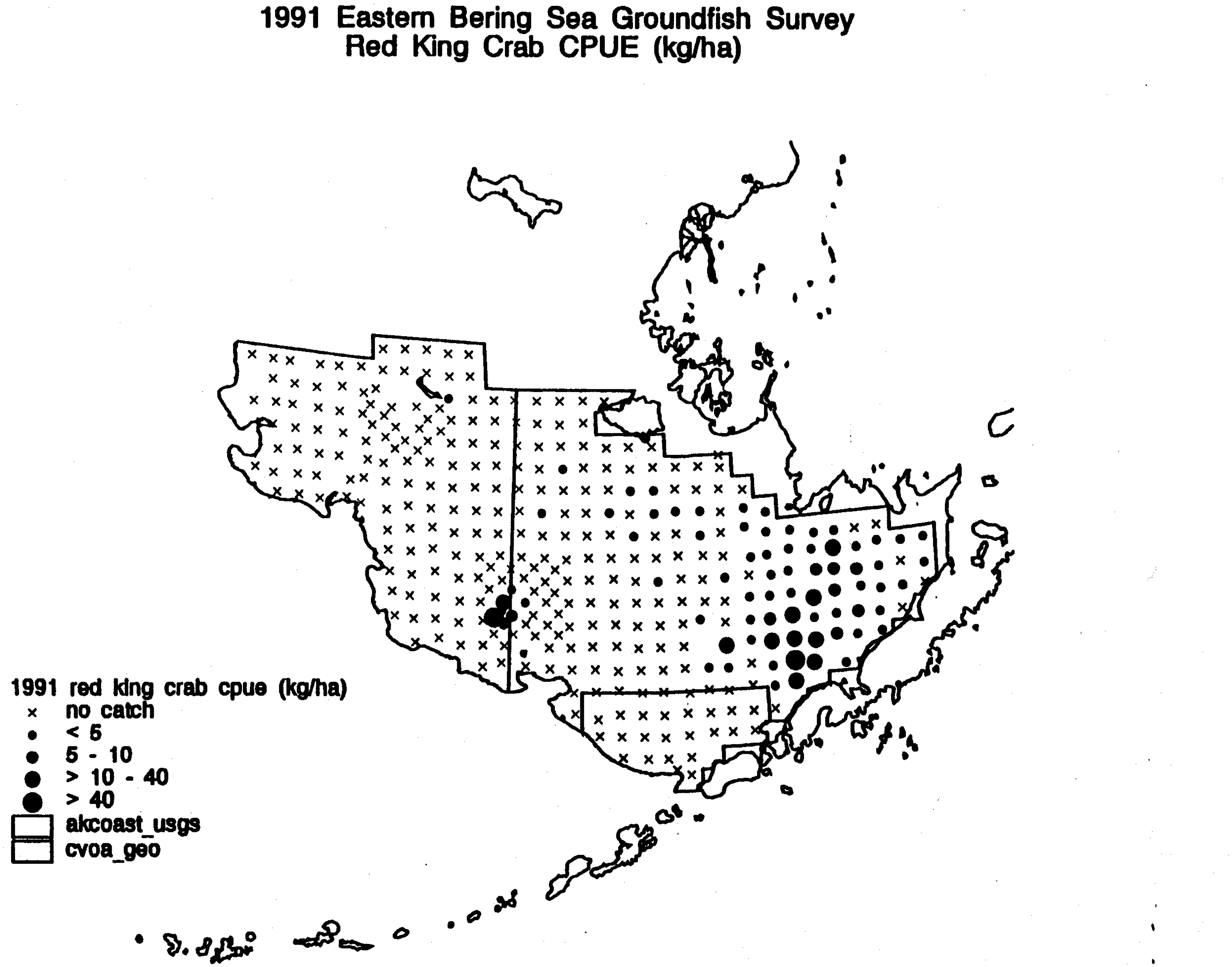


Figure 3-26. Haul-by-haul catch-per-unit-effort (CPUE=kg/hectare) of red king crab from 1991 eastern Bering Sea groundfish bottom trawl survey.

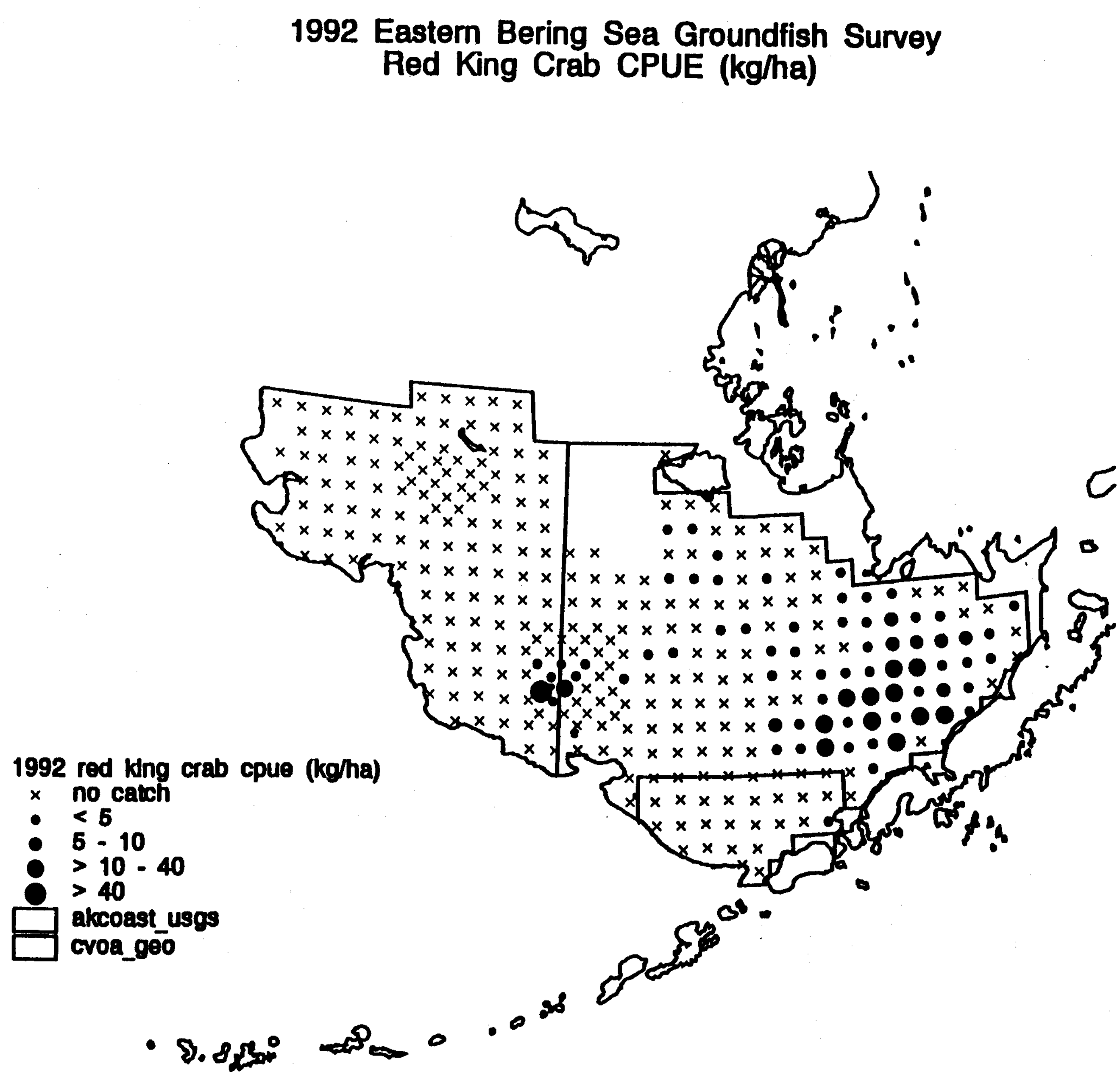


Figure 3-27. Haul-by-haul catch-per-unit-effort (CPUE=kg/hectare) of red king crab from 1992 eastern Bering Sea groundfish bottom trawl survey.

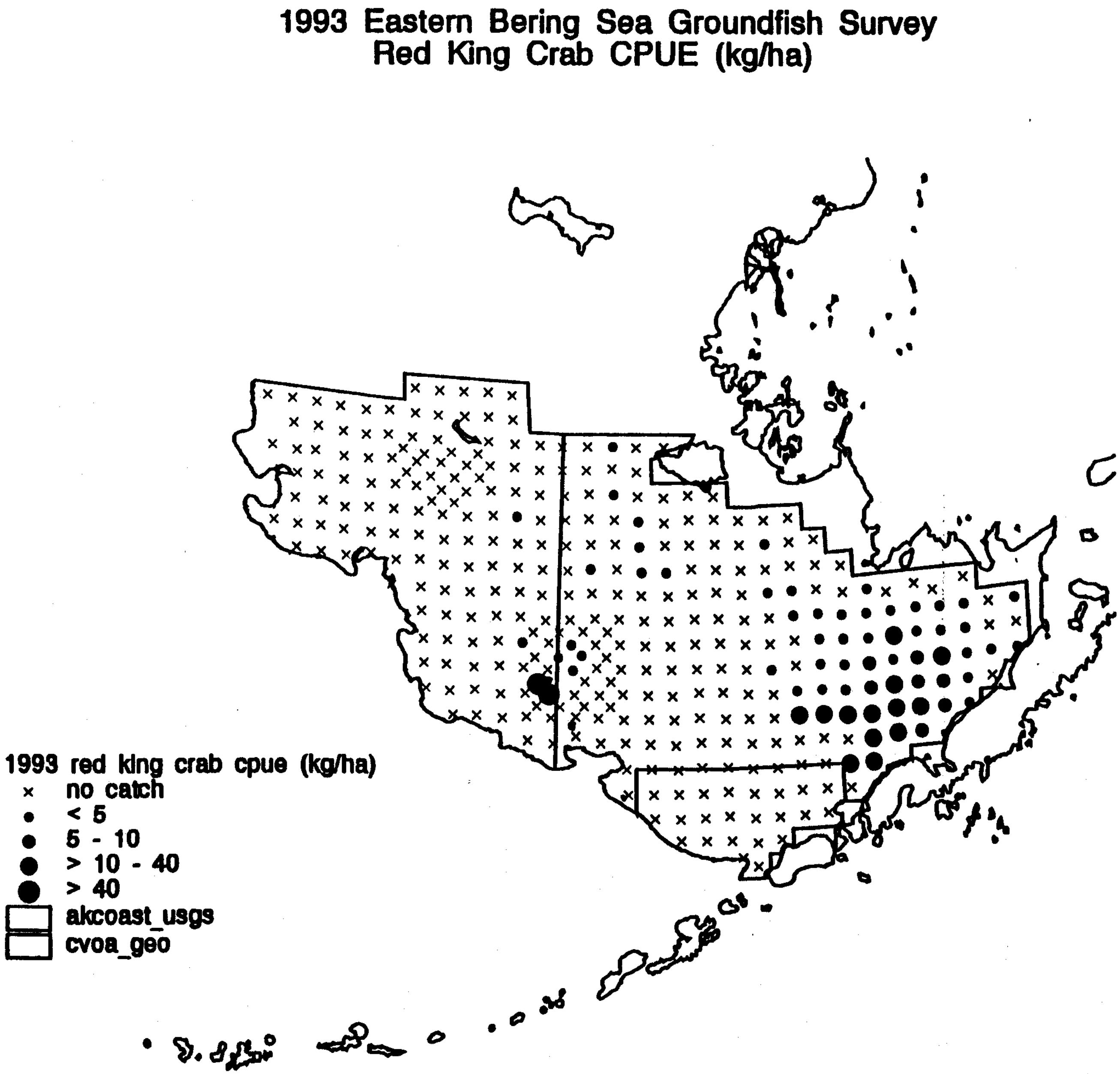


Figure 3-28. Haul-by-haul catch-per-unit-effort (CPUE=kg/hectare) of red king crab from 1993 eastern Bering Sea groundfish bottom trawl survey.

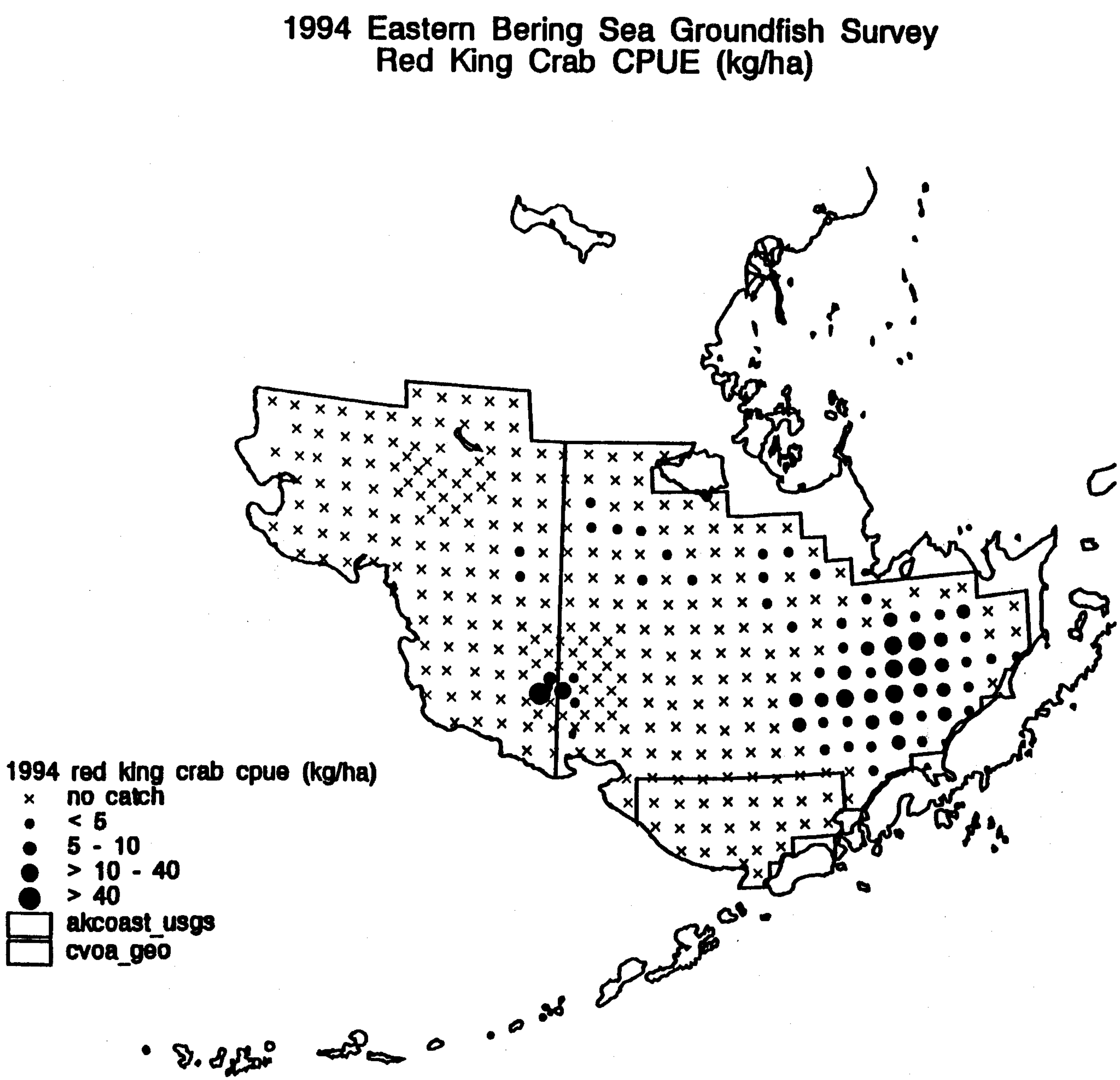


Figure 3-29. Haul-by-haul catch-per-unit-effort (CPUE=kg/hectare) of red king crab from 1994 eastern Bering Sea groundfish bottom trawl survey.

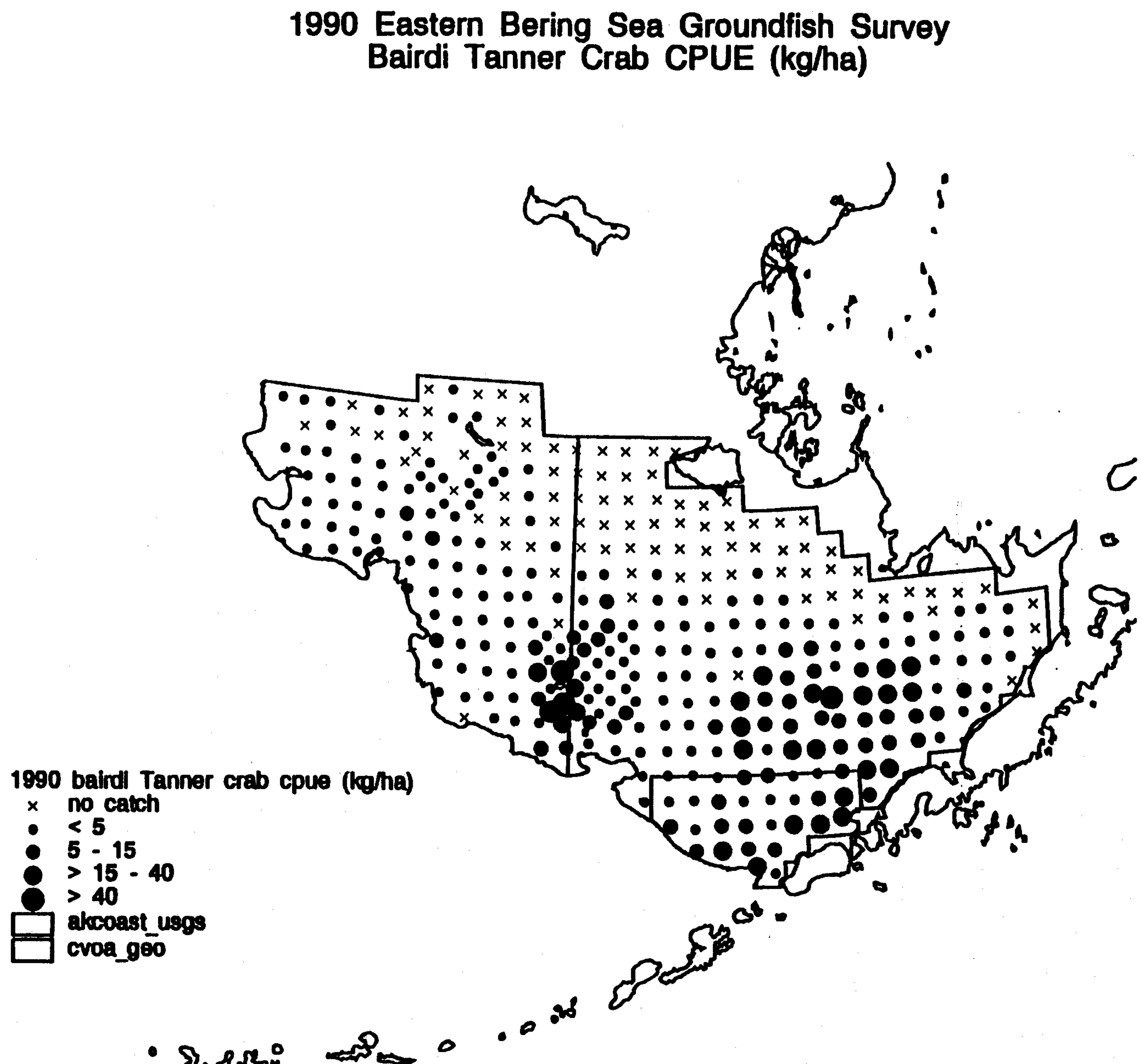


Figure 3-30. Haul-by-haul catch-per-unit-effort (CPUE=kg/hectare) of bairdi tanner crab from 1990 eastern Bering Sea groundfish bottom trawl survey.

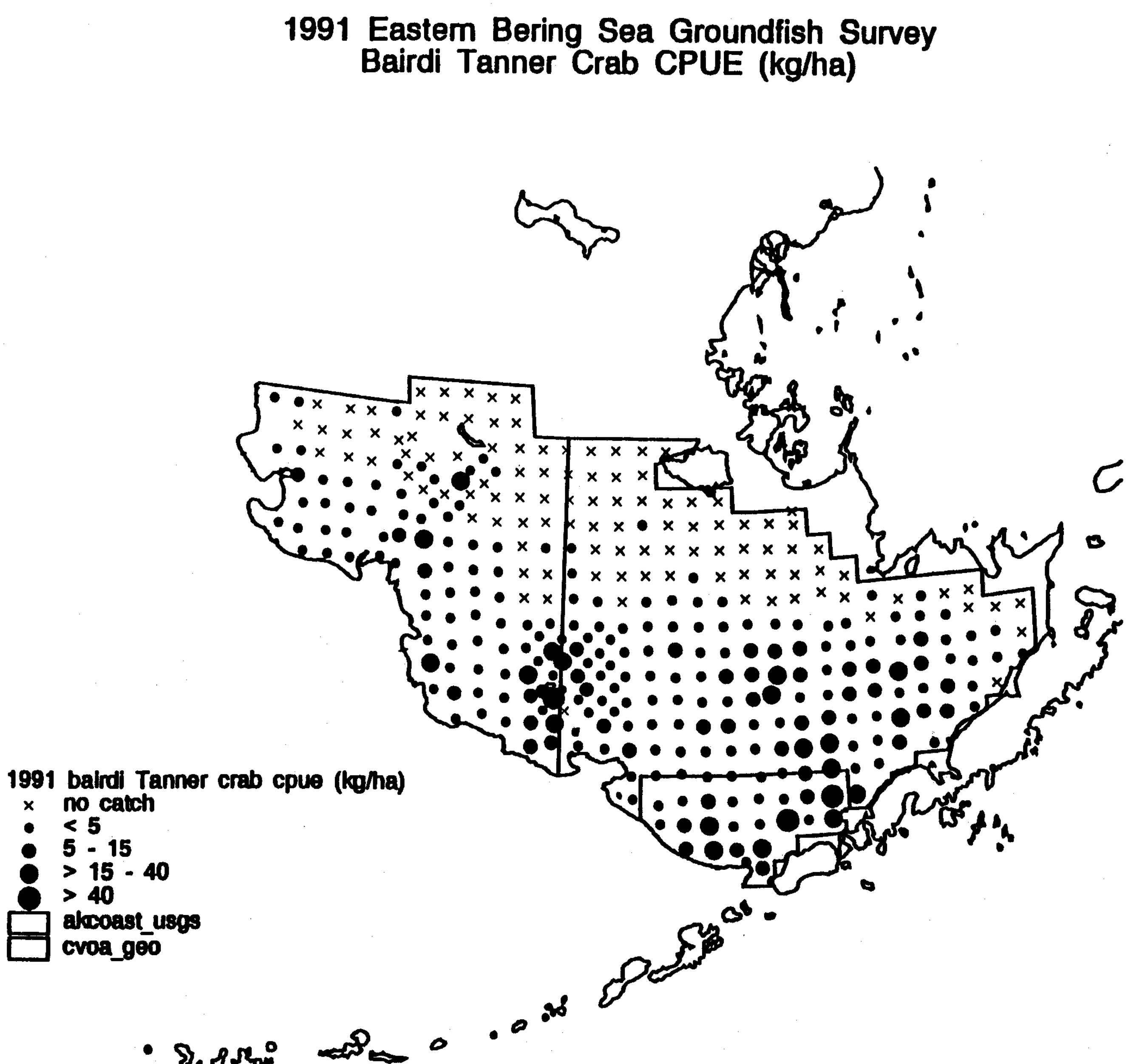


Figure 3-31. Haul-by-haul catch-per-unit-effort (CPUE=kg/hectare) of bairdi tanner crab from 1991 eastern Bering Sea groundfish bottom trawl survey.

1992 Eastern Bering Sea Groundfish Survey
Bairdi Tanner Crab CPUE (kg/ha)

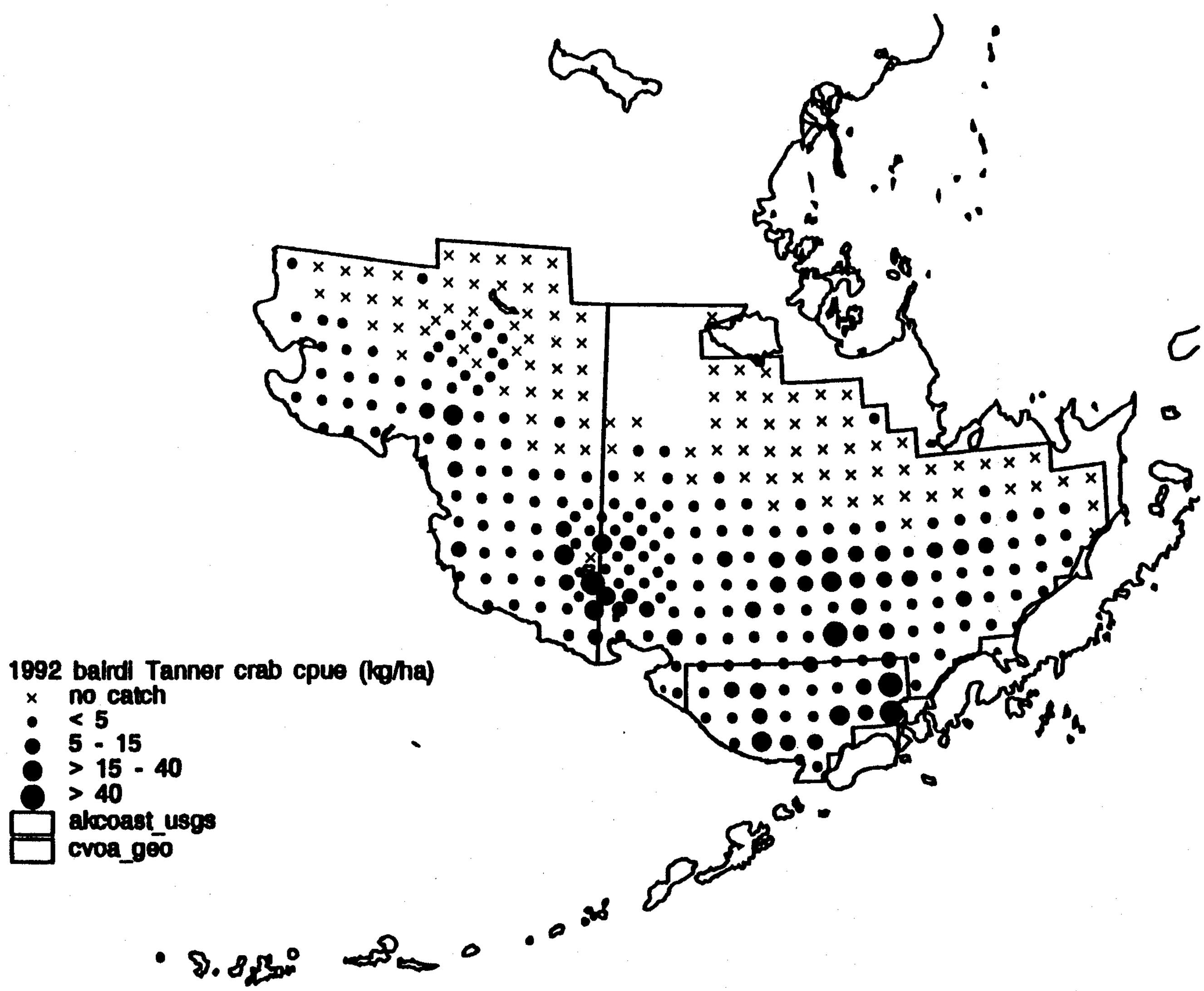


Figure 3-32. Haul-by-haul catch-per-unit-effort (CPUE=kg/hectare) of bairdi tanner crab from 1992 eastern Bering Sea groundfish bottom trawl survey.

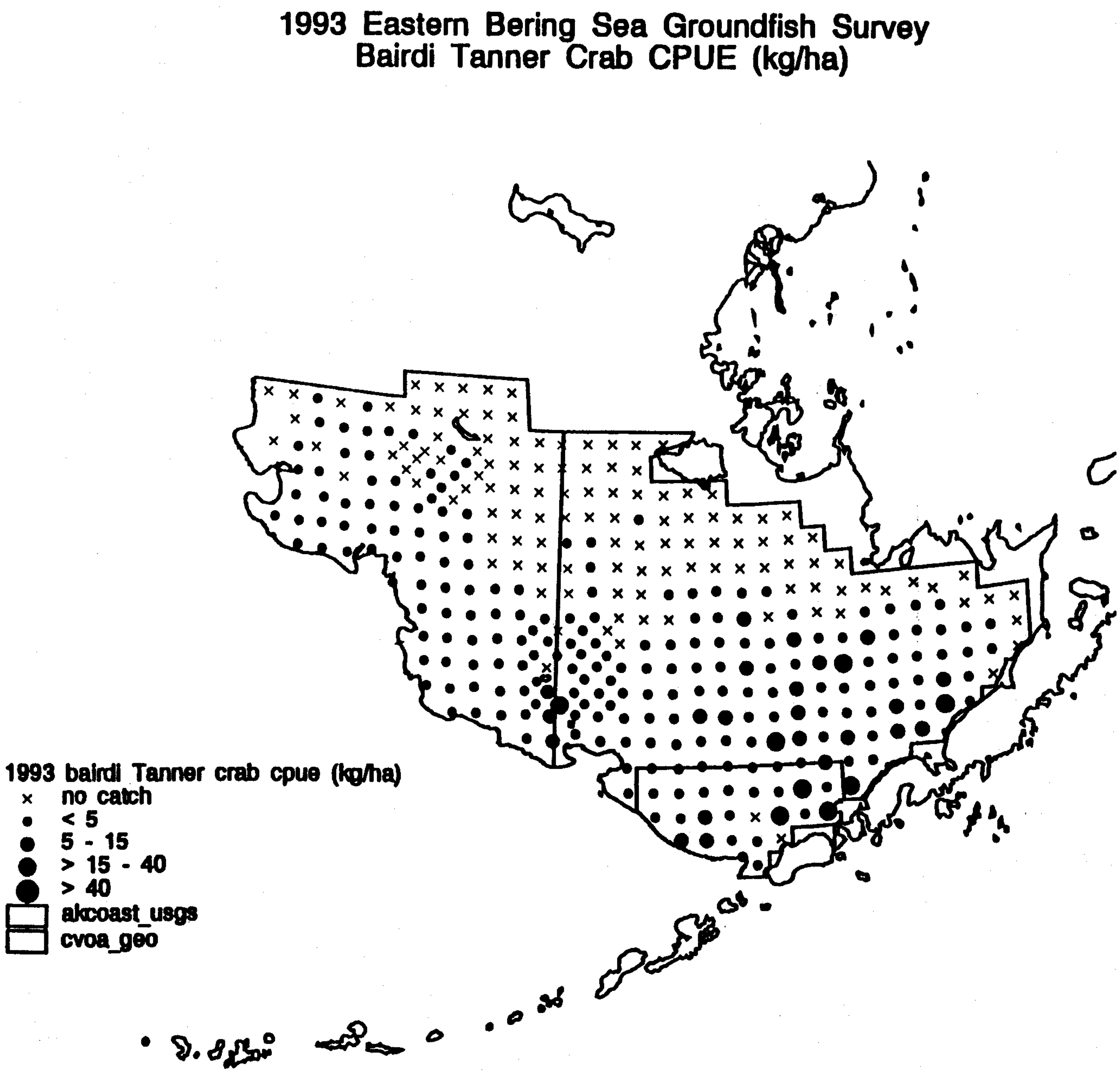


Figure 3-33. Haul-by-haul catch-per-unit-effort (CPUE=kg/hectare) of bairdi tanner crab from 1993 eastern Bering Sea groundfish bottom trawl survey.

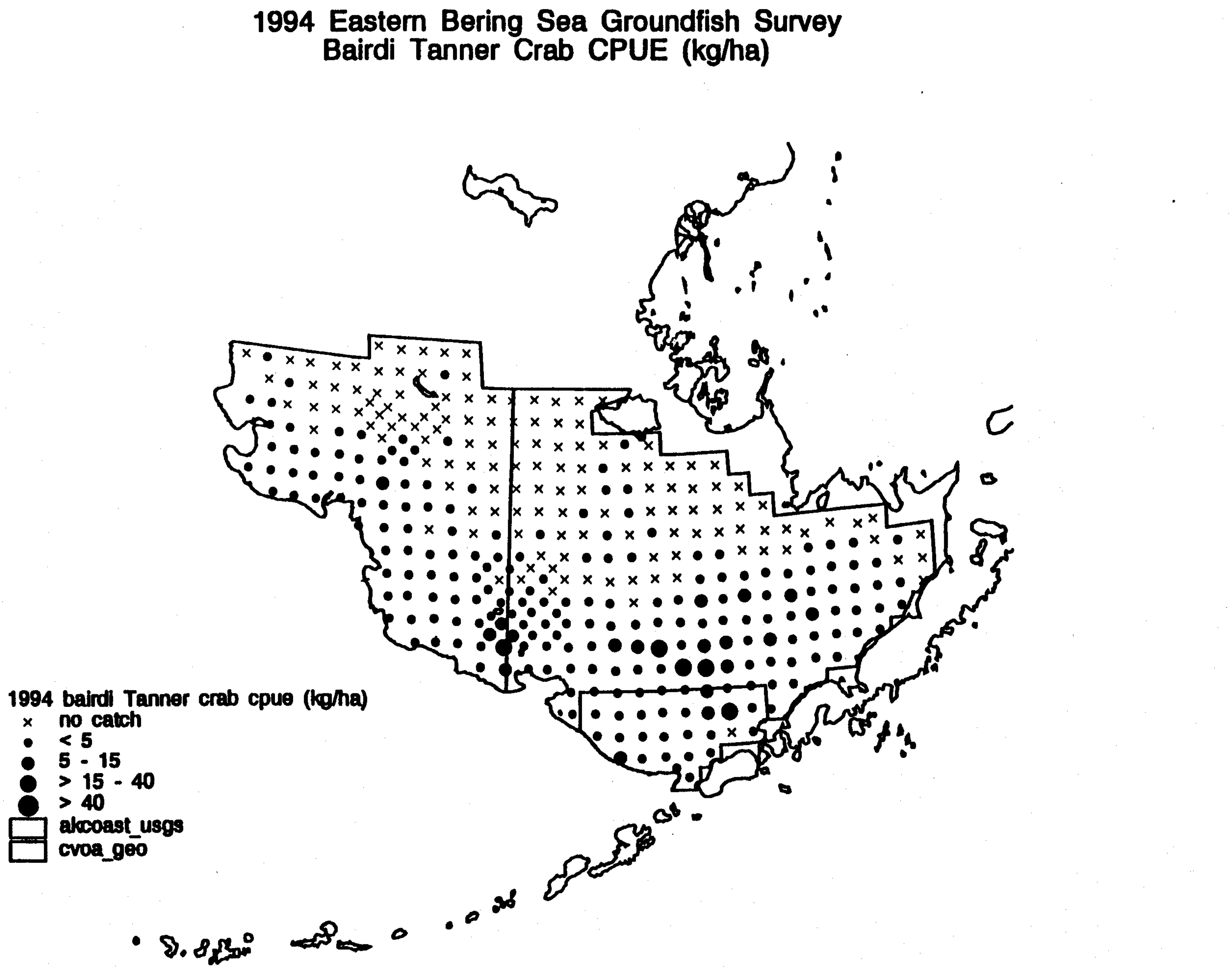


Figure 3-34. Haul-by-haul catch-per-unit-effort (CPUE=kg/hectare) of bairdi tanner crab from 1994 eastern Bering Sea groundfish bottom trawl survey.

Table 3-5. Average catch per unit effort (CPUE=kg per km-squared) of Pacific halibut, red king crab, and Bairdi tanner crab in the CVOA and outside the CVOA in Areas 51 and 52 (see Figure 3-3) from the 1990-94 summer bottom trawl surveys. See Figures 3-20 to 3-34 for station locations and haul-by-haul CPUEs.

Year	Area	Halibut	Red King Crab	Bairdi Tanner Crab
1990	Area 51	1.88	2.22	4.44
	Area 52	1.60	0.93	3.45
	CVOA	3.91	0.13	10.29
1991	Area 51	2.80	3.10	3.33
	Area 52	1.29	0.79	2.62
	CVOA	2.11	0.00	17.24
1992	Area 51	2.22	1.55	2.82
	Area 52	1.47	0.46	1.91
	CVOA	5.34	0.01	13.73
1993	Area 51	3.96	1.99	2.06
	Area 52	2.36	1.34	0.72
	CVOA	4.58	0.00	4.89
1994	Area 51	3.65	1.34	1.57
	Area 52	3.04	0.95	0.75
	CVOA	5.53	0.00	2.55

Table 3-6. Comparisons of pollock CPUE and prohibited species bycatch rates of individual vessels that fished for pollock both within and outside of the CVOA in the same quarter (quarters 3 and 4, 1992-93). Individual vessels had at least 10 sampled hauls in each area and quarter to be utilized. Only pelagic trawl data are shown.

1992

QTR=3	VESSEL	ZONE	POLLOCK TONS	HOURS	CPUE	HALIBUT KG/MT	HERRING KG/MT	SALMON #/MT	KING CRAB #/MT	TANNER CRAB #/MT
CB	1	CVOA-SHELF	325.2	125.0	2.60	0.0277	0.0000	0.0246	0.0000	0.0000
		AREA 51	351.8	98.5	3.57	0.0227	0.0000	0.0284	0.0000	0.0000
	2	CVOA-SHELF	3,643.4	233.7	15.59	0.0000	1.5557	0.7828	0.0000	0.0011
		AREA 51	265.6	36.7	7.24	0.0000	0.1242	0.1130	0.0000	0.0000
	3	CVOA-SHELF	3,646.3	548.6	6.65	0.0247	2.1586	0.0233	0.0000	0.0000
		AREA 51	337.5	157.5	2.14	0.2104	0.0000	0.0800	0.0000	0.0000
	4	CVOA-SHELF	167.9	110.0	1.53	0.0000	0.0000	0.1072	0.0000	0.0000
		AREA 51	238.3	114.9	2.07	0.0000	18.3385	0.0294	0.0000	0.0000
	5	CVOA-SHELF	547.0	150.9	3.63	0.1481	0.3821	0.1609	0.0000	0.0000
		AREA 51	377.6	101.2	3.73	0.0132	18.2356	0.0318	0.0000	0.0000
QTR=4										
C/P	1	CVOA-SHELF	2,965.7	180.3	16.45	0.0199	0.0000	0.0020	0.0000	0.0000
		AREA 52	558.1	55.8	10.00	0.0000	0.0000	0.0000	0.0000	0.6630
	2	CVOA-SHELF	1,106.7	102.1	10.84	0.0000	0.0000	0.0000	0.0000	0.0000
		AREA 52	271.2	35.1	7.73	0.0000	0.0000	0.0000	0.0000	0.0000
	3	CVOA-SHELF	441.4	19.5	22.64	1.3253	0.0000	0.0000	0.0000	1.7331
		AREA 51	289.8	26.3	11.04	1.7011	0.0000	0.0000	0.0000	0.0000
		AREA 52	1,570.8	103.8	15.14	1.2453	0.0000	0.0000	0.0000	0.0000

Table 3-6 (continued).

1993

QTR=3	VESSEL	ZONE	POLLOCK TONS	HOURS	CPUE	HALIBUT KG/MT	HERRING KG/MT	SALMON #/MT	KING CRAB #/MT	TANNER CRAB #/MT
C/P	1	CVOA-SHELF	2,834.3	184.3	15.38	0.0000	5.0182	0.7737	0.0000	0.0000
		AREA 51	2,609.1	178.3	14.64	0.0119	0.1506	0.5220	0.0000	0.0000
		AREA 52	1,122.9	89.6	12.53	0.0080	0.0053	0.1808	0.0000	0.0000
	2	CVOA-SHELF	3,999.3	127.9	31.26	0.0650	0.0940	0.6851	0.0000	0.0000
		AREA 51	6,664.3	230.6	28.90	0.0368	0.2185	0.1510	0.0000	0.0000
		AREA 52	3,550.3	119.8	29.63	0.0724	0.0006	0.0245	0.0000	0.0003
	3	CVOA-SHELF	1,494.7	37.2	40.22	0.0000	0.1238	0.5192	0.0000	0.0000
		AREA 51	5,071.0	184.1	27.55	0.0148	0.0302	0.2662	0.0000	0.0000
		AREA 52	3,104.5	107.7	28.81	0.0158	0.0055	0.0177	0.0000	0.0000
	4	CVOA-SHELF	1,290.9	113.8	11.34	0.0302	0.1046	0.4199	0.0000	0.0000
		AREA 51	3,542.6	278.1	12.74	0.0000	0.2896	0.1609	0.0000	0.0000
		AREA 52	883.8	100.7	8.77	0.0362	0.0091	0.3711	0.0000	0.0011
	5	CVOA-SHELF	1,974.1	92.5	21.35	0.0000	1.2907	0.0431	0.0000	0.0000
		AREA 51	7,728.2	239.9	32.21	0.0128	0.0163	0.3428	0.0000	0.0000
		AREA 52	2,379.3	80.6	29.53	0.0668	0.0181	0.0660	0.0000	0.0000
	6	CVOA-SHELF	2,448.2	87.4	28.00	0.0020	0.1091	0.7565	0.0000	0.0000
		AREA 51	1,096.5	45.2	24.29	0.2189	0.0246	0.2161	0.0000	0.0000
		AREA 52	514.0	19.2	26.82	0.6342	0.0525	0.0156	0.0000	0.0097
	7	CVOA-SHELF	3,616.2	63.3	57.10	0.0581	0.1911	0.3835	0.0000	0.0000
		AREA 51	7,182.1	159.1	45.15	0.0253	0.1601	0.0913	0.0000	0.0008
		AREA 52	3,934.6	119.4	32.95	0.1360	0.0330	0.0241	0.0000	0.0000
	8	CVOA-SHELF	3,222.8	108.1	29.82	0.0000	0.0515	0.2578	0.0000	0.0000
		AREA 51	5,269.0	178.7	29.49	0.0106	0.0676	0.1740	0.0000	0.0000
		AREA 52	2,088.3	80.7	25.88	0.0000	0.0450	0.0532	0.0000	0.0091
MS	9	CVOA-SHELF	12,567.8	1,164.5	10.79	0.0146	0.7726	1.8657	0.0000	0.0000
		AREA 52	2,624.5	304.9	8.61	0.0141	0.0297	0.0339	0.0000	0.0000
	10	CVOA-SHELF	365.1	29.3	12.46	0.1917	0.0110	0.0685	0.0000	0.0000
		AREA 51	1,944.8	75.7	25.70	0.0000	0.4042	0.0000	0.0000	0.0000
		AREA 52	1,007.5	32.4	31.06	0.0000	0.0000	0.0000	0.0000	0.0000
CB	11	CVOA-SHELF	2,598.7	113.1	22.98	0.0000	0.8466	0.5014	0.0000	0.0000
		AREA 51	1,757.1	84.8	20.73	0.0000	2.3117	1.0329	0.0000	0.0000
		AREA 52	1,290.2	75.8	17.03	0.0000	0.0000	0.5557	0.0000	0.0000
QTR=4										
C/P	1	CVOA-SHELF	967.0	43.7	22.15	0.0000	0.0000	0.0341	0.0000	0.0000
		AREA 52	1,954.1	104.8	18.64	0.6903	0.0000	0.0261	0.0000	0.0000
	2	CVOA-SHELF	1,733.9	165.8	10.46	0.4314	0.0000	0.3149	0.0000	0.0000
		AREA 52	1,541.0	111.3	13.84	0.2219	0.0013	0.0376	0.0000	0.0013
	3	CVOA-SHELF	4,575.6	165.9	27.58	0.0771	0.0000	0.0662	0.0000	0.0000
		AREA 52	2,514.6	141.1	17.82	0.0191	0.0000	0.0060	0.0000	0.0000

Table 3-7. Average pollock cpue and bycatch rates of prohibited species inside and outside the CVOA by all observed foreign, joint-venture and domestic fishing vessels (excluding motherships) in quarters 2-4, 1981-90. All data from the Bogoslof district (Area 518) are excluded. Data from outside the CVOA includes the Aleutian Islands (area 540), but inshore portions of Area 51 where little pollock fishing has occurred (areas 512, 514 and 516). Data from Norris (1992).

	Bottom Pollock Fishery		Midwater Pollock Fishery	
	Inside CVOA	Outside CVOA	Inside CVOA	Outside CVOA
Pollock CPUE (mt/hr)				
Apr-Jun	8.2	5.2	22.6	10.5
Jul-Sep	6.5	5.4	13.2	14.7
Oct-Dec	6.0	4.5	9.5	10.8
Chinook Salmon Bycatch Rate (#/mt total catch)				
Apr-Jun	0.013	0.003	0.010	0.004
Jul-Sep	0.004	0.000	0.004	0.000
Oct-Dec	0.019	0.015	0.023	0.015
Other Salmon Bycatch Rate (#/mt total catch)				
Apr-Jun	0.000	0.000	0.004	0.001
Jul-Sep	0.078	0.003	0.203	0.007
Oct-Dec	0.008	0.009	0.009	0.006
Halibut Bycatch Rate (%)				
Apr-Jun	0.32	0.16	0.01	0.01
Jul-Sep	0.10	0.06	0.01	0.01
Oct-Dec	0.29	0.18	0.03	0.01
Herring Bycatch Rate (%)				
Apr-Jun	0.02	0.02	0.18	0.00
Jul-Sep	0.34	0.08	0.83	0.20
Oct-Dec	0.02	0.16	0.02	0.34
Red King Crab Bycatch Rate (#/mt total catch)				
Apr-Jun	0.25	0.04	0.01	0.00
Jul-Sep	0.20	0.08	0.00	0.00
Oct-Dec	0.40	0.09	0.01	0.00
Bairdi Tanner Crab Bycatch Rate (#/mt total catch)				
Apr-Jun	0.94	0.50	0.04	0.03
Jul-Sep	0.35	0.34	0.03	0.04
Oct-Dec	0.70	0.55	0.05	0.04

Table 3-8. Bering Sea Pollock Fishery CPUE (mt pollock/hours trawled) by Year (1990-93), Season, Procesor Type (C/P=Catcher Processor; CB=Inshore Catcher Boat), Gear and Zone.

		Pelagic Trawls						Bottom Trawls					
		Zone						Zone					
Process		CVOA-518	CVOA-SHELF	518	51	52	Grand Total	CVOA-518	CVOA-SHELF	518	51	52	Grand Total
1990 A-season													
C/P	Mean of ind. CPUE	99.1	55.9	97.6	63.3	32.2	76.9		26.7		64.2	52.9	43.7
	Sum of hours	48.8	851.3	2,412.3	1,932.1	635.8	5,880.3		1,819.2		1,162.6	284.5	3,267.8
	Sum of pollock	1,710.8	18,566.6	85,300.0	59,954.5	14,483.2	180,015.1		21,638.9		31,178.6	8,600.8	61,421.1
	Grand Mean CPUE	35.0	21.8	35.4	31.0	22.8	30.6						
CB	Mean of ind. CPUE	217.1	70.1	116.4	45.8		76.0		6.4				5.9
	Sum of hours	19.8	1,229.2	104.8	332.9		1,686.7		110.0				127.7
	Sum of pollock	1,763.8	34,880.1	5,080.2	9,126.3		50,850.4		529.4				574.7
	Grand Mean CPUE	89.0	28.4	48.5	27.4		30.1						
1990 B-Season													
C/P	Mean of ind. CPUE		11.3		19.5	29.1	27.6	1.4	3.4	0.9	1.6	24.6	20.6
	Sum of hours		1,463.6		389.8	14,566.2	16,419.6	31.5	74.1	32.0	177.2	1,400.0	1,714.8
	Sum of pollock		12,676.4		5,256.0	307,088.1	325,020.5	41.6	209.1	24.8	244.9	24,214.5	24,734.9
	Grand Mean CPUE		8.7		13.5	21.1	19.8	1.3	2.8	0.8	1.4	17.3	14.4
CB													
	Mean of ind. CPUE		11.8		8.9		11.7						
	Sum of hours		13,546.3		58.3		13,611.8						
	Sum of pollock		109,670.2		258.6		109,992.1						
	Grand Mean CPUE		8.1		4.4		8.1						
1991 A-season													
C/P	Mean of ind. CPUE	171.5	32.1	58.9	36.4	10.1	53.4		10.2		8.1	5.4	8.4
	Sum of hours	35.8	1,873.1	5,316.8	52.2	33.3	7,311.2		1,434.3		384.4	907.2	2,736.2
	Sum of pollock	3,119.5	36,225.9	142,706.0	627.9	314.9	182,994.1		9,210.9		2,057.9	3,815.1	15,116.1
	Grand Mean CPUE	87.3	19.3	26.8	12.0	9.4	25.0		6.4		5.4	4.2	5.5
CB													
	Mean of ind. CPUE		23.9	40.3	13.8		24.4		6.5		11.5		7.4
	Sum of hours		4,574.6	159.8	7.0		4,741.4		280.9		38.7		319.6
	Sum of pollock		63,480.2	2,500.0	94.5		66,074.7		1,406.2		271.2		1,677.4
	Grand Mean CPUE		13.9	15.6	13.5		13.9		5.0		7.0		5.2
1991 B-Season													
C/P	Mean of ind. CPUE		5.7		13.6	16.9	15.4		4.9		4.8	12.2	9.6
	Sum of hours		2,261.2		3,259.3	16,973.6	22,494.2		223.7		702.8	1,467.7	2,404.2
	Sum of pollock		10,958.2		36,910.0	239,231.7	287,099.9		962.9		2,466.0	16,431.1	19,888.4
	Grand Mean CPUE		4.8		11.3	14.1	12.8		4.3		3.5	11.2	8.3
CB													
	Mean of ind. CPUE	3.3	7.1		6.3	19.1	7.6		3.1		5.1		4.1
	Sum of hours	36.0	15,209.5		1,580.3	356.4	17,188.4		141.8		76.2		218.0
	Sum of pollock	115.5	73,997.0		7,743.4	5,527.3	87,454.9		367.8		401.5		769.3
	Grand Mean CPUE	3.2	4.9		4.9	15.5	5.1		2.6		5.3		3.5

Grand Mean=total mt pollock/total hours trawled for year, season, gear, processor, zone cell; Mean of Ind CPUE=mean of individual haul cpue's for cell; Source: NMFS Observer Data.

Table 3-8. (continued).

		Pelagic Trawls						Bottom Trawls					
		Zone						Zone					
Process		CVOA-518	CVOA-SHELF	518	51	52	Grand Total	CVOA-518	CVOA-SHELF	518	51	52	Grand Total
1992 A-season													
C/P	Mean of ind. CPUE		21.4		31.8	29.3	28.2		17.4		20.1	4.4	16.0
	Sum of hours		2,599.4		2,993.9	2,591.2	8,184.5		1,384.2		1,028.6	610.1	3,041.1
	Sum of pollock		38,499.2		65,066.7	52,103.1	155,669.1		16,977.8		15,288.9	2,045.0	34,336.3
	Grand Mean CPUE		14.8		21.7	20.1	19.0		12.3		14.9	3.4	11.3
CB	Mean of ind. CPUE		9.2		67.2		9.8		3.3		3.9	5.7	3.4
	Sum of hours		11,393.9		50.1		11,444.0		498.0		36.5		540.6
	Sum of pollock		80,747.8		1,316.4		82,064.2		1,418.3		100.0		1,542.1
	Grand Mean CPUE		7.1		26.3		7.2		2.8		2.7		2.9
1992 B-Season													
C/P	Mean of ind. CPUE		6.1		8.9	21.6	20.5				2.9	10.4	8.4
	Sum of hours		8.8		974.1	10,365.5	11,348.4				258.0	700.9	958.9
	Sum of pollock		54.2		7,764.5	165,119.7	172,938.5				596.3	6,484.6	7,080.9
	Grand Mean CPUE		6.1		8.0	15.9	15.2				2.3	9.3	7.4
CB													
	Mean of ind. CPUE		19.5		12.9	35.2	19.5		21.3		21.4	4.5	21.2
	Sum of hours		11,360.8		1,126.7	300.7	12,788.2		1,297.7		83.5	3.3	1,384.5
	Sum of pollock		147,383.1		6,092.5	6,171.9	159,647.6		19,030.2		1,009.2	15.0	20,054.4
	Grand Mean CPUE		13.0		5.4	20.5	12.5		14.7		12.1	4.5	14.5
1992 CDQ-Season (December)													
C/P	Mean of ind. CPUE		49.0		14.8	19.3	38.0		10.7				10.3
	Sum of hours		1,533.6		105.4	531.3	2,170.3		297.0				306.0
	Sum of pollock		35,714.1		1,071.0	7,478.9	44,263.9		2,563.3				2,573.3
	Grand Mean CPUE		23.3		10.2	14.1	20.4						
CB													
	Mean of ind. CPUE		20.9				20.9						
	Sum of hours		1,223.3				1,223.3						
	Sum of pollock		15,920.8				15,920.8						
	Grand Mean CPUE		13.0				13.0						

Grand Mean=total mt pollock/total hours trawled for year, season, gear processor, zone cell; Mean of Ind CPUE=mean of individual haul cpue's for cell: Source: NMFS Observer Data.

Table 3-8. (continued).

Pelagic Trawls

Process		Zone CVOA-518	CVOA-SHELF	518	51	52	Grand Total
1993 A-season							
C/P	Mean of ind. CPUE		63.8		27.8	34.0	36.7
	Sum of hours		1,003.1		4,021.0	1,551.4	6,592.4
	Sum of pollock		28,225.7		78,737.5	34,583.9	141,580.1
	Grand Mean CPUE		28.1		19.6	22.3	21.5
CB	Mean of ind. CPUE		61.3		27.7		60.0
	Sum of hours		4,014.6		258.4		4,272.9
	Sum of pollock		115,281.9		5,089.7		120,371.5
	Grand Mean CPUE		28.7		19.7		28.2
1993 CDQ (June-August 14)							
C/P	Mean of ind. CPUE		47.2		26.3	38.3	40.8
	Sum of hours		393.6		216.2	30.5	640.3
	Sum of pollock		9,078.6		3,891.1	987.3	13,957.0
	Grand Mean CPUE		23.1		18.0	32.4	21.8
1993 B-Season							
C/P	Mean of ind. CPUE		17.6		37.3	31.3	35.0
	Sum of hours		151.3		4,785.7	2,915.4	7,852.4
	Sum of pollock		1,625.2		116,178.9	59,653.3	177,457.4
	Grand Mean CPUE		10.7		24.3	20.5	22.6
CB	Mean of ind. CPUE		26.3		32.7	33.7	26.6
	Sum of hours		8,241.6		94.5	75.8	8,411.9
	Sum of pollock		151,428.0		2,009.0	1,290.2	154,727.1
	Grand Mean CPUE		18.4		21.3	17.0	18.4
1993 CDQ-Season (Sept. 23-December)							
C/P	Mean of ind. CPUE		28.5		14.4	23.4	26.1
	Sum of hours		1,759.2		214.6	707.0	2,680.7
	Sum of pollock		31,228.9		2,997.5	13,343.6	47,569.9
	Grand Mean CPUE		17.8		14.0	18.9	17.7

Bottom Trawls

Process		Zone CVOA-518	CVOA-SHELF	518	51	52	Grand Total
1993 A-season							
C/P	Mean of ind. CPUE		14.0		20.2	18.2	17.1
	Sum of hours		1,180.7		788.3	1,566.1	3,541.3
	Sum of pollock		10,970.5		11,567.9	18,473.5	41,016.0
	Grand Mean CPUE		9.3		14.7	11.8	11.6
CB	Mean of ind. CPUE		11.6				11.4
	Sum of hours		987.5				998.0
	Sum of pollock		8,219.7				8,245.0
	Grand Mean CPUE		8.3				8.3
1993 CDQ (June-August 14)							
C/P	Mean of ind. CPUE		2.5		2.3	1.6	2.3
	Sum of hours		15.8		998.4	56.4	1,070.5
	Sum of pollock		28.8		2,263.0	102.7	2,394.5
	Grand Mean CPUE		1.8		2.3	1.8	2.2
1993 B-Season							
C/P	Mean of ind. CPUE		0.6		6.9	15.9	8.9
	Sum of hours		3.3		557.9	157.7	718.9
	Sum of pollock		2.1		2,844.2	1,834.5	4,680.8
	Grand Mean CPUE		0.6		5.1	11.6	6.5
CB	Mean of ind. CPUE						
	Sum of hours						
	Sum of pollock						
	Grand Mean CPUE						
1993 CDQ-Season (Sept. 23-December)							
C/P	Mean of ind. CPUE		3.3		3.1	2.8	3.1
	Sum of hours		76.8		301.3	73.7	451.8
	Sum of pollock		241.2		858.3	199.2	1,298.7
	Grand Mean CPUE		3.1		2.8	2.7	2.9

Grand Mean=total mt pollock/total hours trawled for year, season, gear, processor, zone cell; Mean of Ind CPUE=mean of individual haul CPUEs for cell; Source: NMFS Observer Data.

3.4 EFFECTS OF CVOA ON MARINE MAMMALS

Natural histories of marine mammals inhabiting the Bering Sea and neighboring North Pacific Ocean waters were summarized in the original analysis for Amendments 18/23, and is incorporated in its entirety here by reference. Since that summary was completed, however, new research information has been obtained on some North Pacific pinnipeds (Steller sea lions, harbor seals and northern fur seals) and cetaceans (killer and gray whales) that frequent the CVOA. The population of Steller sea lions, currently listed as threatened under the Endangered Species Act, has continued to decline to the point where they are being considered for reclassification as endangered, while gray whale populations have increased to where they were recently removed from the list of endangered species.

Possible effects of continuation of the CVOA on marine mammals relate primarily to the availability of pollock as a prey item for species which forage in the southeastern Bering Sea, particularly since mortality associated with incidental catches of marine mammals in the groundfish trawl fleet is low. Consequently, could the continuation of the CVOA reduce or increase the availability of pollock to marine mammal foragers through its effect on distribution of fishing effort in the B-season? This question will be addressed after brief summaries of recent research information on various pinnipeds and cetaceans that frequent the CVOA.

Steller sea lions

Steller sea lions were listed as threatened under the Endangered Species Act by emergency rule in April 1990 after a significant (-64%) decline in their population size in Alaska through 1989. Since 1989, their population has continued to decline (another 24%), with most of this decline coming from southwest Alaska (western and central Gulf of Alaska, Bering Sea, and Aleutian Islands). NMFS recently published a status review of the US Steller sea lion population (NMFS 1995) as part of the process of considering a reclassification of their listing to endangered. While a decision on the reclassification has not yet been made, the Steller sea lion Recovery Team (appointed by NMFS in 1990 to write a Recovery Plan for the species), after reviewing and discussing (in November 1994) recent data on population trends, stock separation, energetics and diet summarized in the draft status review, recommended that the sea lion stock west of Cape Suckling (about 145°W longitude) be listed as endangered while the stock to the east remain as threatened.

An important proximate cause of the decline appears to be reductions in juvenile (post-weaning) sea lion survival. Causes of this increase in juvenile mortality are not known with certainty. However, the following factors have probably contributed most significantly to the decline (or have not been eliminated as possible contributors): incidental take, shooting, disease, and changes in the prey base. The first two factors contributed to the decline mostly during the 1970s and early 1980s, but little since then. Disease could still be a factor, but would have to be very widespread and chronic. Changes in the prey base have occurred in the last several decades, but sorting out "natural" change from "human-induced" change has been elusive.

Information on Steller sea lions that was obtained since the EA for Amendments 18/23 was written was reviewed in the status review, and will be briefly summarized here.

Diet and Foraging: As a prey item for Steller sea lions, walleye pollock ranked first in importance in 11 of 13 series of studies summarized by NMFS (1995), and second in importance in the remaining two. Other prey consumed off Alaska were Pacific cod, Atka mackerel, salmon, octopus, squid, Pacific herring, capelin, sand lance, flatfishes, and sculpins. Most of the prey are schooling fish, many of which are commercially exploited. Juvenile sea lions tend to eat smaller fish than adults. Consequently, the overlap in the size distribution of their food with commercial fisheries may be less than that of adults.

Sea lion pups (less than 1 year old) are more restricted in their foraging range, both vertically and horizontally than adults. In summer, adult females with pups foraged close to shore (usually < 20 km) and to shallow depths (most < 30 m), while in winter, they ranged much farther (some > 500 km offshore) and dove to greater depths (often > 250 m). Pups by their sixth month (January) were able to range more than 300 km in a trip, but most of their trips offshore were brief (< 1 day), and their dives were shallow (<10 m) and short (< 1 min) (Merrick and Loughlin 1993).

Movements and distribution: Steller sea lions are found predominately from shore to the edge of the continental shelf, but are not uncommon in waters several thousand meters deep (see Appendix 2 for platform of opportunity sighting data). During the breeding season (summer), adult Steller sea lions (ages 4+) are generally located near shore and near rookeries. Juveniles (1-3 year olds) are less tied to the rookeries during summer, but are often found at nearby haulouts. After the breeding season, sea lions disperse widely, such that rookeries that were populated in the summer may be vacated in winter. In the Bering Sea, sea lions have been most often sighted over shelf waters from Unimak Pass northward and near the Aleutian Islands. On the shelf, there is a clustering of sightings in the southeastern Bering Sea (including the CVOA). It is thought, based on telemetry data and how the population was distributed prior to the decline, that the shelf in the southeastern Bering Sea is an important foraging area for sea lions (which led to the designation of the EBS critical habitat foraging area, discussed below under Management Actions and see Figure 3.35). The sighting data, however, because it has not been standardized by sighting effort, cannot by itself be used to determine relative importance of certain areas to Steller sea lions.

Stock Identification and Population Trends: Recent genetic and other data suggest that there are at least two stocks of Steller sea lions: one located east and south of Cape Suckling, Alaska (located near 60°N, 145°W) and one located to the west. The smaller eastern stock has been either stable or increasing in recent years, while the (formerly) much larger western stock has declined, and continues to decline, significantly. Declines in the western stock were first observed in the late 1970s in the eastern Aleutian Islands (which includes the CVOA) by Braham et al. (1980), where the reduction in numbers has been near 80% between 1976-94. Groups of sea lions associated with two areas in the Bering Sea, one located in the Pribilof Islands and the other on Amak/Sea Lion Rock near the Alaskan Peninsula have declined 95% since 1960 and 75% since 1975, respectively.

Population viability analyses (Merrick and York 1994; York and Merrick 1993) using either aggregate counts on rookeries from the Kenai Peninsula to Kiska Island, or individual trends for each of the 26 rookeries in the area, predicted that the western stock will be reduced to very low levels (< 10 animals) within 100 years from the present if the 1985-94 trends persist. Times to extinction were 63 and 95 years, respectively for the aggregate and individual rookery models. If only the less severe 1989-94 trend persists into the future, then neither model type predicted the extinction of the western stock within 100 years. However, the decline is predicted to continue and reach an adult female population of around 3,000 animals in the next 20 years, at which time individual rookeries would disappear. It was principally discussion of these recent modeling results, and recent continued declines in pup counts in the western stock area, that prompted the Recovery Team to recommend a change of listing status for the western stock to endangered.

Management Actions Taken by NMFS and NPFMC: The record of specific Steller sea lion conservation management actions taken by NMFS and the NPFMC since the listing includes:

- creation of 3 nautical mile (nm) radius no-entry buffer zones around all sea lion rookeries west of 150° W longitude (April 1990);

- prohibition of shooting at or near sea lions and reductions in the number of sea lions that could be killed incidental to commercial fishing (April 1990);

- spatial allocations, and conditions on temporal allocations of pollock TAC in the Gulf of Alaska (June 1991);

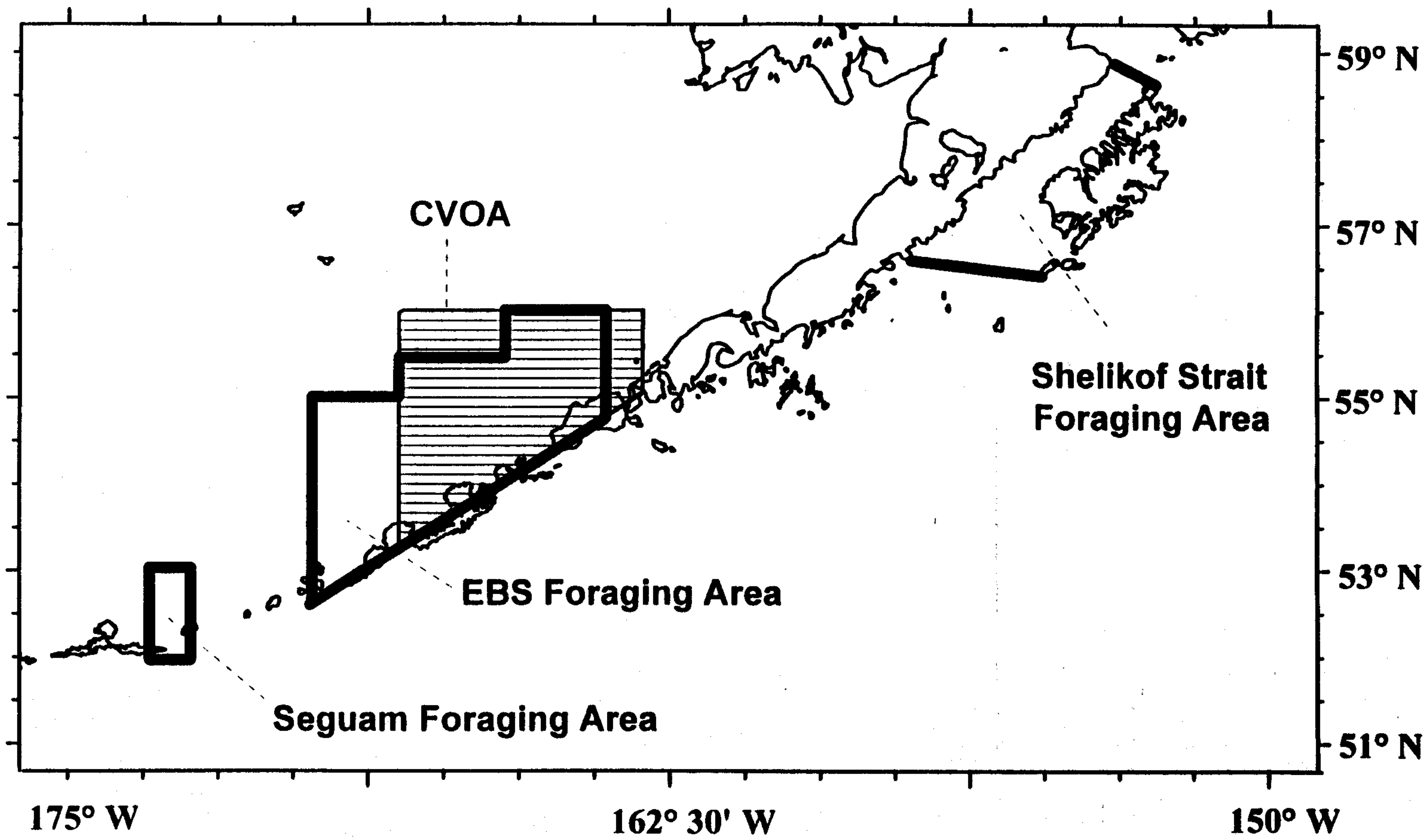


Figure 3-35. Critical habitat foraging areas designated for the Steller sea lion in Seguam Pass (Aleutian Islands fishery management area), Eastern Bering Sea (EBS; Bering Sea fishery management area) and Shelikof Strait (Gulf of Alaska fishery management area. The Catcher Vessel Operational Area (CVOA) is also shown.

- creation of year-round 10 nm radius trawl fishery exclusion zones around all rookeries west of 150°W longitude, and 20 nm radius trawl fishery exclusion zones around 6 rookeries in the eastern Aleutian Islands during the BSAI pollock A-season (June 1991, January 1992, and January 1993);

- publication of a final recovery plan for the species written by the recovery team for NMFS (December 1992);

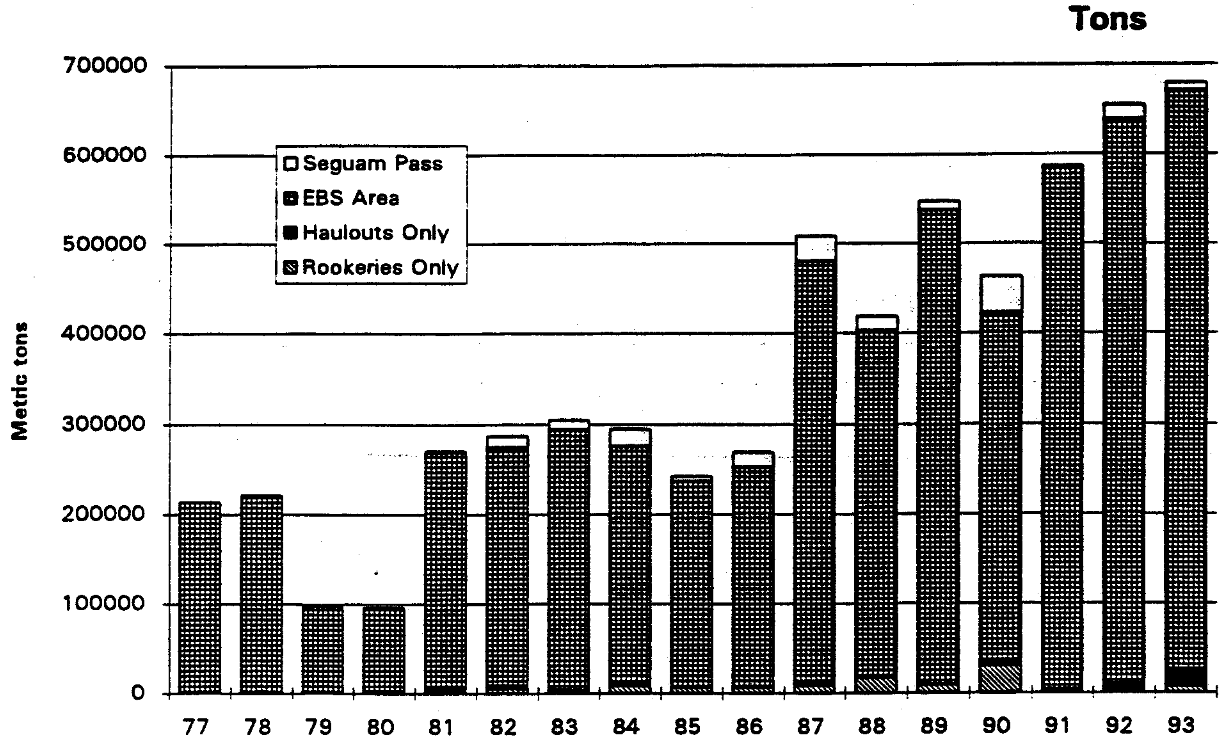
- designation of critical habitat under the ESA in April 1993 (58 FR 17181). Specific areas designated as critical habitat were (1) all rookeries and major haul outs (where greater than 200 sea lions had been counted, but where few pups are present and little breeding takes place), including a) a zone 3,000 feet (914 m) landward and seaward from each site east of 144°W longitude (including those in Alaska, Washington, Oregon and California); and b) a zone 3,000 feet (914 m) landward and 20 nmi (36.5 km) seaward of each site (36 rookeries and 79 haul outs) west of 144°W longitude where the population had declined more precipitously and where the former center of abundance of the species was located; and 2) three aquatic foraging regions within the core of the species' range (Figure 3.35). Note the high degree of overlap between the eastern Bering Sea critical habitat foraging area and the CVOA in Figure 3.35.

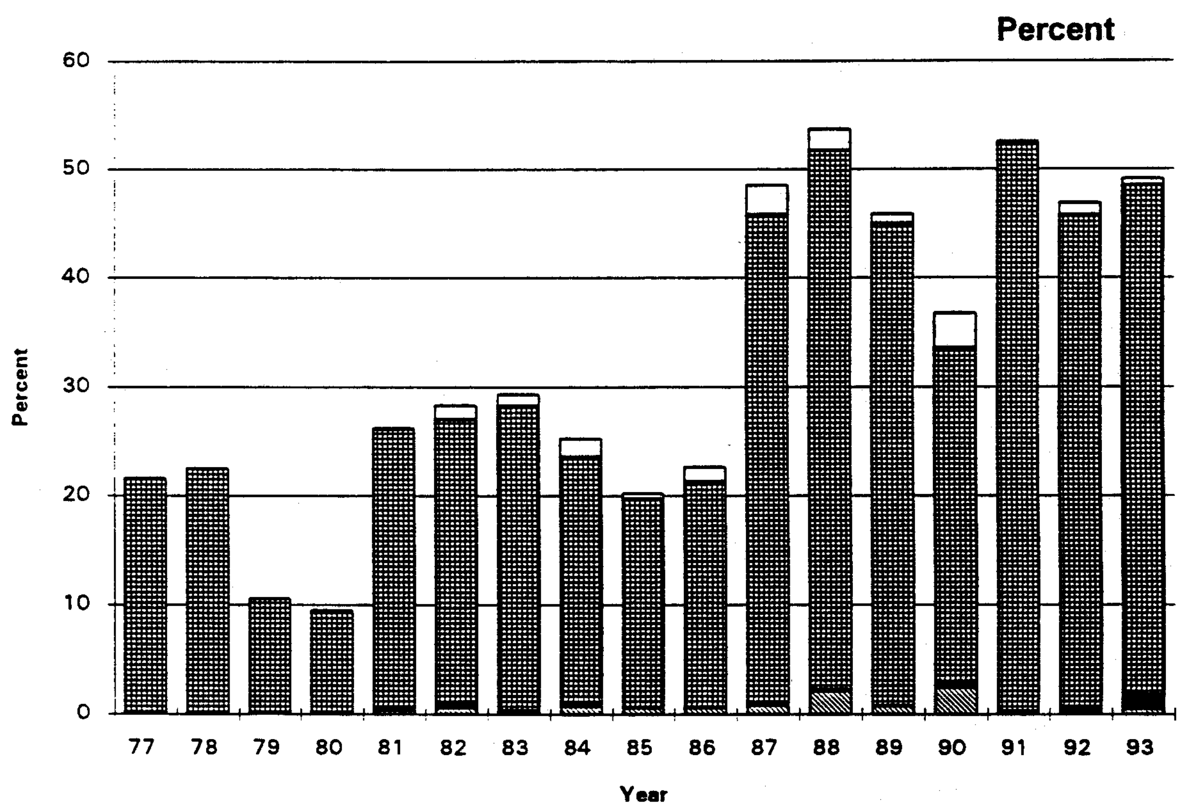
The rationale behind each management action was outlined in each Federal Register notice announcing the action. The shooting prohibition, reduction in incidental take mortality and creation of no-entry zones around rookeries were enacted to limit potential for direct human-related mortality, and had only minor impact on groundfish fisheries in the BSAI and GOA. Spatial-temporal allocations of pollock TAC in the Gulf of Alaska, and creation of trawl-exclusion zones around rookeries were promulgated as part of the ESA Section 7 consultation for the 1991 GOA pollock TAC specifications. In that document, NMFS reviewed and presented data which showed that 1) pollock is a major component of the sea lion diet; 2) sea lions collected near Kodiak Island in the 1980s were lighter, had smaller girths and thinner blubber layers than sea lions from the same area collected in the 1970s; and 3) the pollock fishery had become increasingly concentrated in time and in areas thought to be important to sea lions. NMFS concluded that the spatial and temporal compression of the pollock fishery that occurred during the 1980s in both the GOA and BSAI could have created localized depletions of Steller sea lion prey, which in turn could have contributed to or exacerbated the decline of the sea lion population (5 June 1991). Much of the area in which the pollock (and other groundfish trawl fisheries as well, principally Atka mackerel and Pacific cod) fisheries became spatially compressed in is designated as critical habitat for Steller sea lions (Fritz 1993abc). Estimated removals of pollock from Steller sea lion critical habitat in the BSAI region have increased from between 250,000-300,000 mt from 1981-1986 (between 20-30% of total BSAI pollock landings) to between 410,000-680,000 mt in 1987-93 (between 35-53% of total BSAI pollock landings; Figure 3.36). Much of this increase in pollock landings from critical habitat came from the EBS foraging area, which overlaps considerably with the CVOA.

Pacific harbor seals

Harbor seals are found in all coastal areas of the GOA and are widely distributed in nearshore habitats of the BS (Pitcher, 1980a; Calkins, 1986; Frost and Lowry 1986). Individuals are occasionally observed as far as 100 km offshore (Pitcher, 1980a). Only limited information is available on the diet of harbor seals in Alaska. Pitcher (1980a; b) reported that the harbor seal diet in the GOA was composed of at least 27 species of fish, as well as cephalopods (both octopi and squids) and shrimp in 269 stomachs analyzed. The seven principal prey were (in order of frequency of occurrence): pollock (21 percent), octopus (17 percent), capelin (9 percent), herring (6 percent), Pacific cod (6 percent), flatfishes (5 percent), and eulachon (5 percent). There were some significant regional differences in the harbor seal diet throughout the GOA. Octopus, capelin and cod were more important components of the diet in the Kodiak area, while pollock was the principal prey in the Prince William Sound area. Harbor seal food habits data from the BS (16 stomachs analyzed by Lowry et al., 1986 from animals collected in Bristol Bay) are much less extensive than for the GOA. Herring and capelin were the principal components of the diet of harbor seals in Bristol Bay.

Figure 3-36. Pollock catches within critical habitat for the Steller sea lion in the Bering Sea and Aleutian Islands (BSAI; top) and percent of total BSAI pollock catch caught within critical habitat (bottom).





Little information is available on the size composition of fish in the diet of harbor seals compared with Steller sea lions and northern fur seals. What information is available suggests that harbor seals consume smaller fish than Steller sea lions. Pitcher (1981) found that harbor seals collected from the same area and during the same period as Steller sea lions consumed smaller pollock (mean length of pollock ingested by harbor seals = 19.2 cm; for Steller sea lions, 29.8 cm). This suggests a low overlap in body size between pollock harvested by the fishery and those ingested by harbor seals.

Pacific harbor seal are generally thought of as a coastal, non-migratory species (though occasionally individuals are observed up to 100 km from shore; see Appendix 2 for platform of opportunity sighting data). The status of Pacific harbor seals in Alaska is currently in review. Based on the results of a four-year project to obtain a minimum population estimate for harbor seals in Alaska and other data (e.g., Pitcher 1990), it was clear that harbor seal populations in various areas in Alaska and the North Pacific had vastly different recent trends in abundance. The central and western Gulf of Alaska stock may have decreased recently by as much as 90% (Pitcher 1990), while populations in other portions of the range may be more stable (Bering Sea, southeast Alaska) or increasing (British Columbia; Olesiak et al. 1990). Reasons for the decline in harbor seals in the central and western Gulf of Alaska are not known.

The Bering Sea stock of harbor seals was surveyed in 1991 (Bristol Bay and the northern side of the Alaskan Peninsula) and 1994 (the Aleutian Islands). The total mean count for 1991 survey was 9,324 seals, with 797 from Bristol Bay and 8,527 from the north side of the Alaskan peninsula (Loughlin 1992). The sum of the mean counts from the 1994 Aleutian survey was 2,056 (NMFS unpublished), yielding a total mean count for all three areas of 11,380. If a correction factor (=1.61, to account for seals not hauled out during the survey) is applied to the count, then the estimated abundance of harbor seals in the Bering sea/Aleutian Islands is 18,322. The population in the Bering Sea is thought to be stable since the late 1960s (Loughlin 1992). Locations within the CVOA that harbor seals were sighted during the 1994 Aleutian survey are shown in Figure 3.37.

<u>Northern fur seals</u>

The northern fur seal is a migratory species, returning to the Bering Sea (both of the Pribilof Islands and Bogoslof Island) in summer to breed. Throughout the remainder of the year, fur seals are distributed pelagically throughout the north Pacific Ocean (see Appendix 2 for platform of opportunity sighting data). The CVOA encompasses important foraging and transit zones of fur seals of all ages from May-December, but particularly for pregnant and lactating females, juveniles and departing adult males during August and September.

The most recent estimate for the number of northern fur seals in the North Pacific Ocean is approximately 1,000,000, down approximately 20% from the 1.25 million estimated in 1974. It is thought that much of this decline occurred in the late 1970s, and that the population has been stable at about 1 million since 1980. Northern fur seals are listed as depleted under the MMPA because the population has declined to less than 50% of the estimated size in the 1950s. The current population of northern fur seals on St. George Island (closest to the CVOA) is decreasing, while the larger St. Paul Island population has been stable since 1980. Entanglement in marine debris associated with commercial fishing is a significant factor in mortality for northern fur seals (Fowler 1985; Fowler et al. 1994). Entanglement monitoring programs conducted on the Pribilof Islands throughout the 1980s and 1990s have found that trawl netting is a significant component of entanglement debris found on northern fur seals (Fowler et al. 1994). While harvests of females and entanglement in fishing gear have contributed to the decline in the size of the population since the 1950s, there is also compelling evidence that the carrying capacity (K) of the North Pacific and Bering Sea for fur seals has also changed substantially in that period (NMFS 1993).

The diet of the northern fur seal in the GOA and the BS has been studied at least since the mid-1950s and has been summarized by Kajimura (1984) and Perez and Bigg (1986). In the GOA, data exist for the months of February-July, and indicate a varied diet composed primarily of herring, Pacific sand lance, capelin, squid and

Figure 3-37. Locations in the eastern Aleutian Islands where Pacific harbor seals were sighted during the 1994 Aleutian Islands harbor seal survey (small four-pointed diamonds) and other sources (stars). All locations are within the CVOA.

pollock. In the BS, data exist for the months of June-October, and also reveal a varied diet of small schooling fish and squid. Pollock composed a larger percentage of the diet in the BS (35 percent of diet volume) than in the GOA (5 percent) and Atka mackerel comprised between 10-20 percent of the diet in the BS during June. Foraging occurs to depths up to 200 m over both shelf and pelagic waters (Kajimura 1984; Loughlin et al. 1987; Gentry et al. 1986; Goebel et al. 1991).

The data for northern fur seals, although obtained primarily from females ≥ 3 years of age, suggest that they ingest smaller fish than Steller sea lions. Perez and Bigg (1986) reported that fur seals collected in the north Pacific Ocean ingested primarily 1-2 year-old pollock (total range of 4-40 cm; n = 1,721 pollock from 71 stomachs). The largest fish consumed by northern fur seals in the collections of Perez and Bigg (1986) (n > 3,000 fish) was a 41 cm salmon. Pollock and Atka mackerel fisheries primarily catch fish (target species) larger than 30 and 35 cm, respectively (Hollowed et al., 1991; Lowe 1991; Wespested and Dawson 1991). Consequently, the overlap between fisheries takes and the preferred fish sizes of northern fur seals is low, a conclusion also reached by Swartzman and Haar (1983).

Killer Whales

One of the most common marine mammal/fishery interactions in the Bering Sea is between longline fishing vessels (particularly those targeting on sablefish or Greenland turbot) and killer whales. While this proposal does not deal with longline vessels, it should be noted that the area where interactions are most frequent is a triangular-shaped area from Unimak Pass to the Pribilof Islands to Seguam Pass, much of which also overlaps with the CVOA (Yano and Dahlheim, in prep.) The shelf edge from Unimak Pass to the Pribilof Islands also has a preponderance of the killer whale sightings in the platform of opportunity sighting data, particularly in May-December (Appendix 2). Interactions between killer whales and trawlers have not been as frequent as with longliners in the area. Killer whale populations off Alaska are thought to be stable, and they probably number in the many hundreds of animals, not in the many thousands. This estimate is based on sighting information and surveys conducted in the 1980s, and replicate surveys conducted in 1992 and 1993 by NMFS.

Gray whales

Gray whales migrate through Unimak Pass during both their spring and fall migrations into and out of the Bering Sea, passing through, but not remaining within the CVOA. During the pollock B-season, much of the gray whale population is in the northern part of the Bering Sea. Gray whales have recovered to the point where they were removed from the endangered species list, and may be as numerous now as they have ever been (around 20,000 animals). There is no recent fishery-induced mortality due to incidental take or entanglement.

Pollock as Prey, Fishery Exploitation Rates in the Bering Sea (1990-94) and Impacts of the CVOA

Juvenile pollock are an important prey for a wide variety of marine piscivores, including many groundfish species, marine mammals and seabirds. Some of this information was summarized in the analysis of Amendments 18/23, and will not be reviewed in detail here. However, recent summaries of groundfish and marine mammal food habits information were written by Livingston (1993) and NMFS (1995). Based on data collected in 1985, Livingston (1993) estimated that marine fish (principally pollock) were the primary source of pollock removals (3.8 million mt of pollock, principally age–0), followed by the fishery (1.2 million mt, principally age 3+), marine birds (0.3 million mt, principally age–0) and marine mammals (0.3 million mt, ages 1+). As noted, each "predator" tended to remove a particular size group of pollock, with removals of 0-1 year old pollock dominating (both in terms of numbers and biomass). However, there was considerable annual variability in rates of cannibalism by pollock, which reflected, to some degree, the relative sizes of pollock cohorts at age–0.

Livingston's (1993) pollock "budget" for the eastern Bering Sea as a whole puts removals by various components of the ecosystem (including the fishery) in perspective. However, what is not discussed is the areal distribution of the removals, and that some (e.g., the fishery) may be more spatially concentrated than other predators (e.g., groundfish), to the possible disadvantage of competitors (e.g. marine mammals). Furthermore, pollock removals by the fishery are just that, removals of carbon from the marine ecosystem of the Bering Sea. By contrast, pollock "removals" by groundfish are not carbon losses to the Bering Sea, but transfers to other species some of which are themselves prey for other upper trophic level predators, such as marine mammals and commercially exploited groundfish species (e.g., Pacific cod, various flatfish).

While exploitation rates of pollock ≥ 30 cm in length have been between 8-17% for the last 5 years for the eastern Bering Sea as a whole, Table 3.3 shows that areas to the east of 170°W have had greater harvest rates than areas to the west, and that removals have increasingly come from the east in 1993-94. Much of this area was designated as critical habitat for the Steller sea lion (Figure 3.35). While the relationship between fishery removals of pollock and sea lion population size or trend is unclear (Ferrero and Fritz 1994), spatial concentration of pollock removals in the Bering Sea is contrary to the objectives of the management philosophy utilized for the pollock fishery in the Gulf of Alaska and outlined in the ESA Section 7 consultation on the 1991 GOA fishery. In that document, NMFS concluded that spatial-temporal concentration of pollock removals by the fishery could have contributed to the sea lion decline by creating localized depletions of prey. It is not known whether either the GOA or EBS pollock fisheries actually created localized depletions of sea lion prey, nor how long they lasted. However, since one of the objectives of the CVOA was to prevent preemption of inshore operations if the offshore fleet concentrated its operations in waters adjacent to Dutch Harbor and Akutan, it can be assumed that localized depletions of commercially-sized pollock can be created by the fishery. This could affect sea lions as well. As was shown above in discussing pollock catch and biomass distributions, the establishment of the CVOA in 1992 probably prevented the B-season pollock fisheries in 1993-94 from being more spatially concentrated than they were. In this sense, the CVOA (and the Inshore/Offshore allocation) may not be disadvantageous to sea lions, since it prevents one sector of the fleet (which has its own allocation) from fishing within the CVOA, the majority of which is within critical foraging habitat for the Steller sea lion.

3.5 GULF OF ALASKA PACIFIC COD SURVEY INFORMATION AND FISHERY LOCATIONS

Pacific cod (*Gadus macrocephalus*) occur on the continental shelf and upper slope waters in the Gulf of Alaska and Bering Sea. NMFS bottom trawl surveys of the Gulf of Alaska conducted in 1990 and 1993 have found that about half of the biomass is located at depths of 100 m or less, with about a third between 100-200 m depth (Tables 3.9-3.10). Information on the life history of Pacific cod is limited, but it is thought that they migrate to deeper waters in autumn, spawn in winter and return to shallow waters in spring. Pacific cod deposit demersal eggs which hatch within 10-20 days, releasing pelagic larvae. In the Bering Sea, juvenile cod frequent rocky bottom areas near shore before they move offshore into deeper waters (Lewbel 1983). In the Gulf of Alaska, Pacific cod feed on a wide variety of prey, including shrimp, crabs, flatfish, pollock, fishery discards, amphipods, euphausiids, and capelin (Yang 1993). In both the Bering Sea (Livingston et al. 1986; Shimada et al. 1988) and the Gulf of Alaska (Yang 1993), cod become increasingly piscivorous with increasing size. Cod larger than 60 cm in length consumed mostly fish, particularly 1-3 year old pollock. Cod are also known to feed on red king crab, particularly during their molting period in spring.

Recent bottom trawl surveys of the Gulf of Alaska (1990 and 1993) have found similar biomasses (414,000 mt in 1990 and 422,000 mt in 1993) and distributions (both with depth and area) of Pacific cod (Tables 3.9-3.10). Most Pacific cod in the Gulf of Alaska are located in the Western/Central area (which includes the Kodiak, Chirikof and Shumagin subareas from 147°-170°W longitude). The surveys found significant concentrations in Marmot and Shelikof Gullies near Kodiak Island, Shumagin Gully east of the Shumagin Island, on Davidson Bank south of Unimak Island, and on the shelf south of the Fox Islands (Umnak and Unalaska Islands; see

Figures 3.38-3.39). Pacific cod length frequencies by area and depth from the survey are shown in Figures 3.40-3.41.

The most recent stock assessment (utilizing stock synthesis, age-structured modelling) for GOA Pacific cod (Thompson and Zenger 1994) suggests that its exploitable (age 3+) biomass increased from 363,000 mt in 1978 to 820,000 mt in 1987-88, and has declined to about 570,000 mt in 1994. This was due to two above average-sized year-classes in 1977 and 1979, and a long series of average year-classes from 1978-1990 (except 1988). Depending on the fishing mortality rate utilized in the near future and assuming average year-class recruitment sizes, GOA Pacific cod exploitable biomass is projected to decline from 570,000 mt to between 379,000 and 478,000 mt by the year 2000, with annual catches ranging from an annual low of 80,000 mt (in the year 2000 at an $F_{40\%}$=0.34) to a high of 117,000 mt (in 1996 at an $F_{0.1}$=0.57). The TAC in 1995 was set at 69,200 mt.

Pacific cod are fished with three gears, bottom trawls, fish pots, and hook and line (longlines). Observed locations in the GOA fished during 1990-93 by each gear are shown in Appendix 3. The cod trawl fleet, which has caught between 67-90% of the GOA cod since 1987 (Thompson and Zenger 1994), fishes throughout the western and central Gulf of Alaska, frequenting the gullies that the bottom trawl surveys found concentrations of cod. Most of the observed cod pot locations during 1990-93 have been near Kodiak Island; the percentage of the GOA cod harvest caught using pots has increased from 1-5% in 1987-89 to almost 20% in 1994 (Thompson and Zenger 1994). The longline fleet has fished throughout the western/central GOA and has caught between 8-28% of the GOA cod catch since 1987.

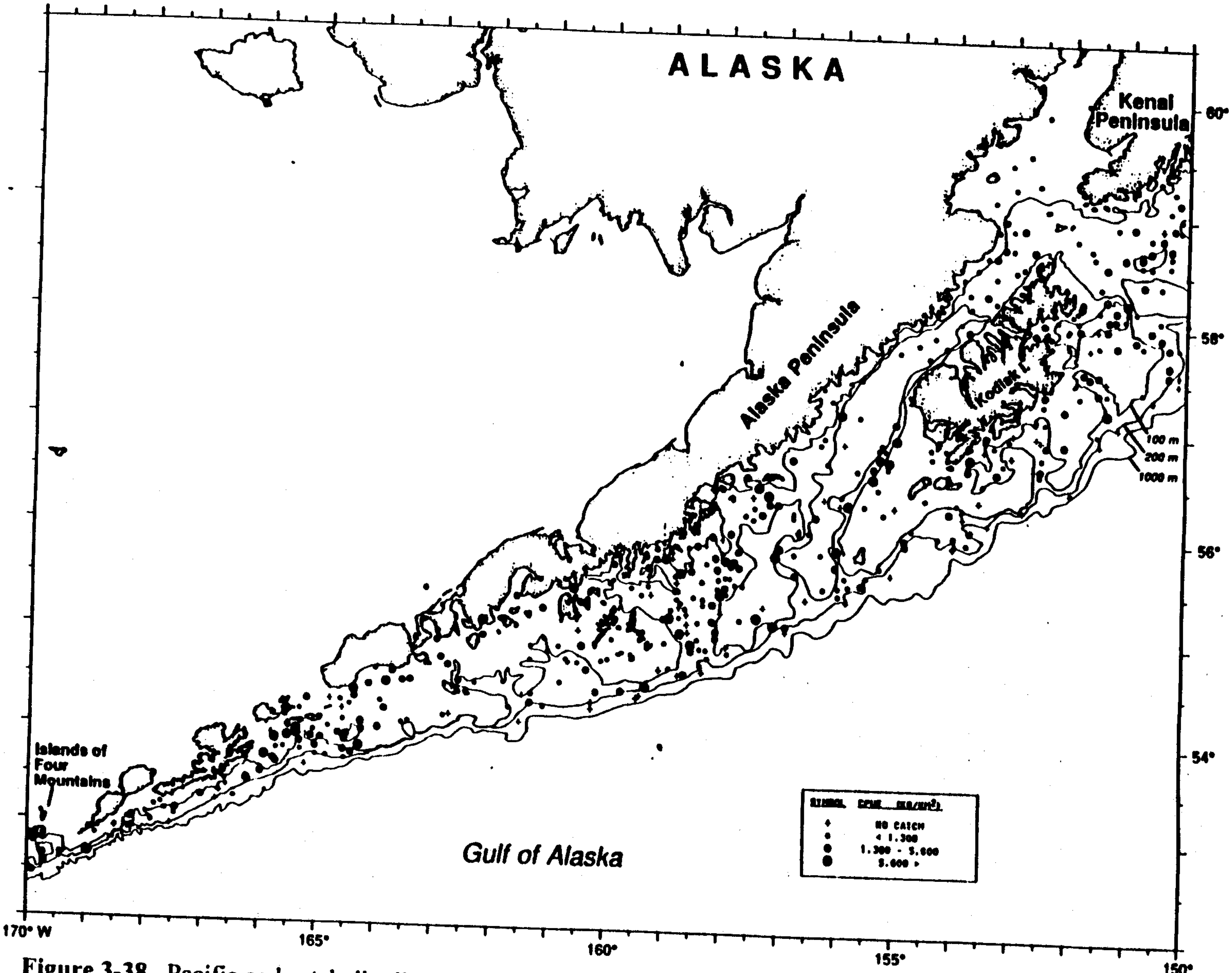


Figure 3-38. Pacific cod catch distribution and relative abundance during the NMFS 1990 Gulf of Alaska groundfish bottom trawl survey. Catch abundance categories are: 1) none, 2) less than the mean (1,300 kg/hectare), 3) between the mean and two standard deviations above the mean, and 4) greater than two standard deviations above the mean.

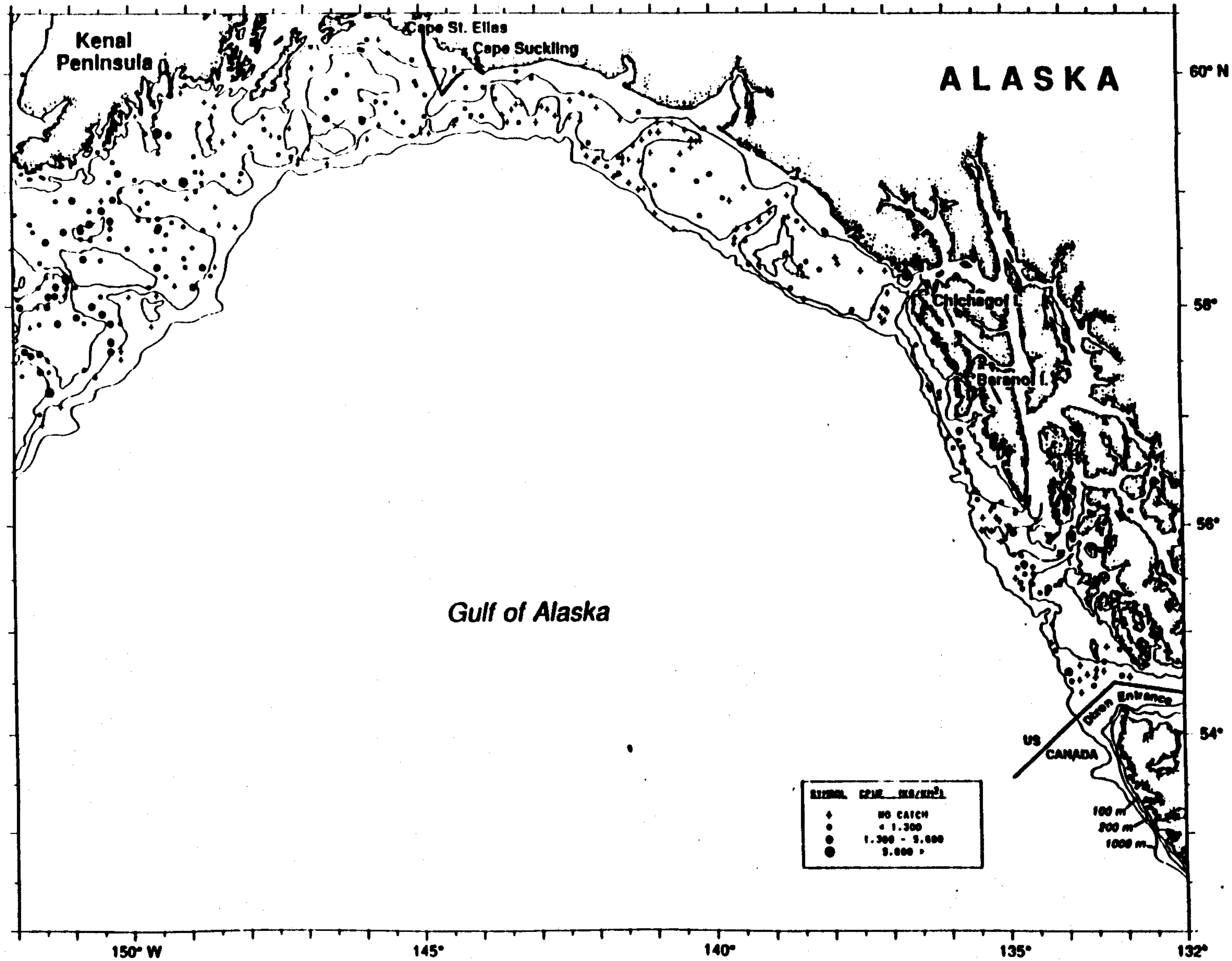


Figure 3-38. (continued).

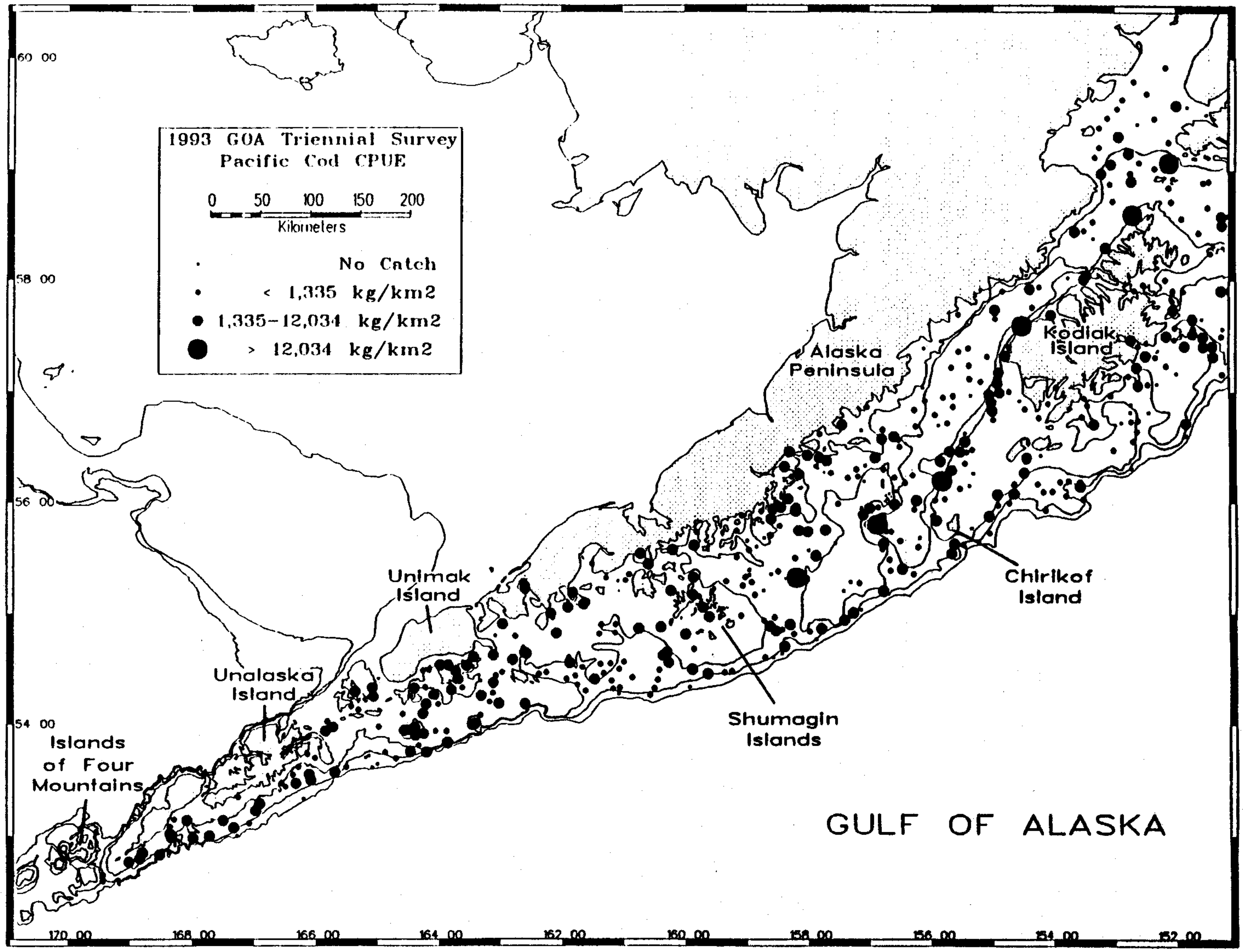
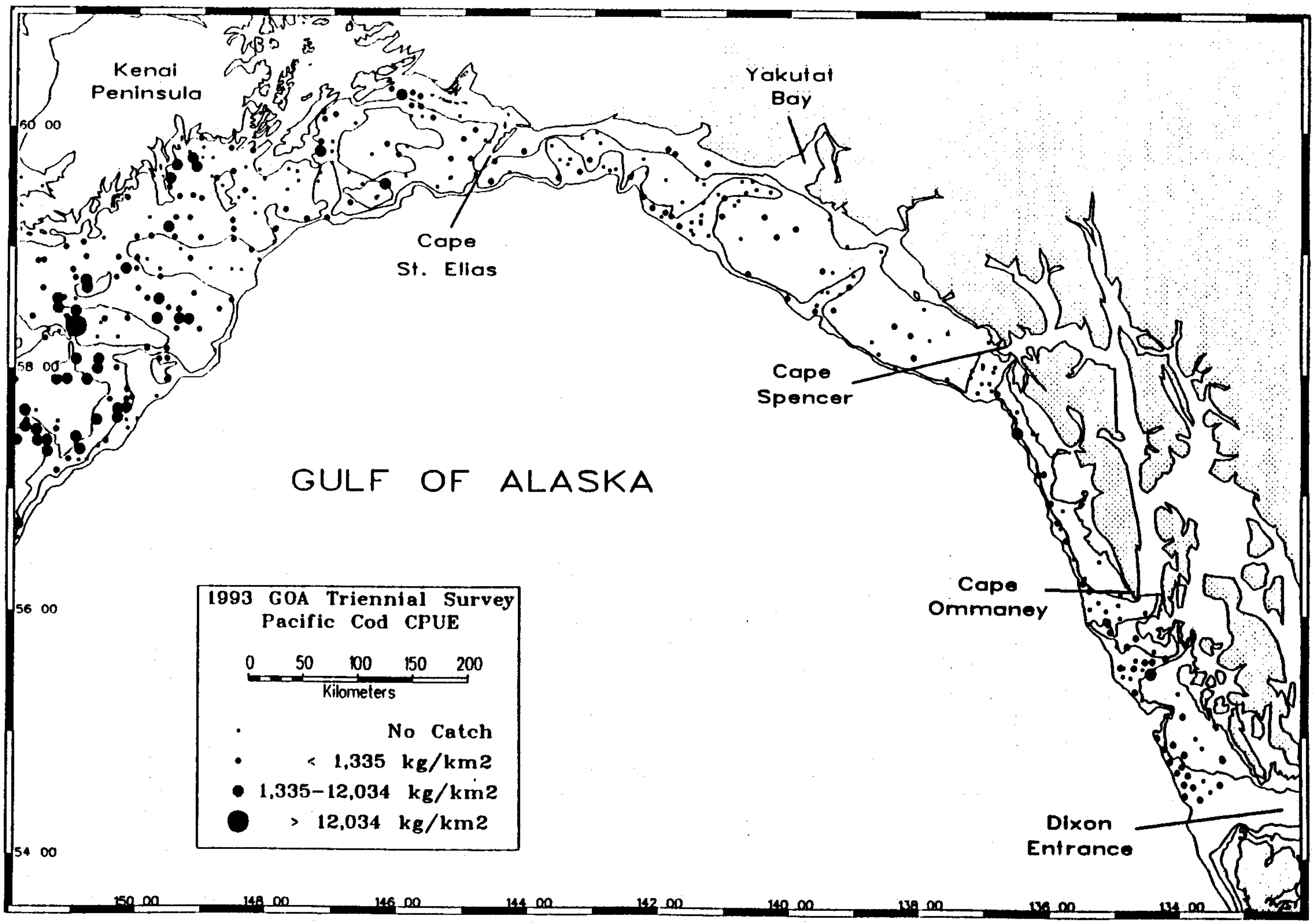


Figure 3-39.Distribution and relative abundance of Pacific cod from the 1993 Gulf of Alaska bottom trawl survey. Abundance is categorized by catches below the mean, between the mean and two standard deviations above the mean, and greater than two standard deviations above the mean.



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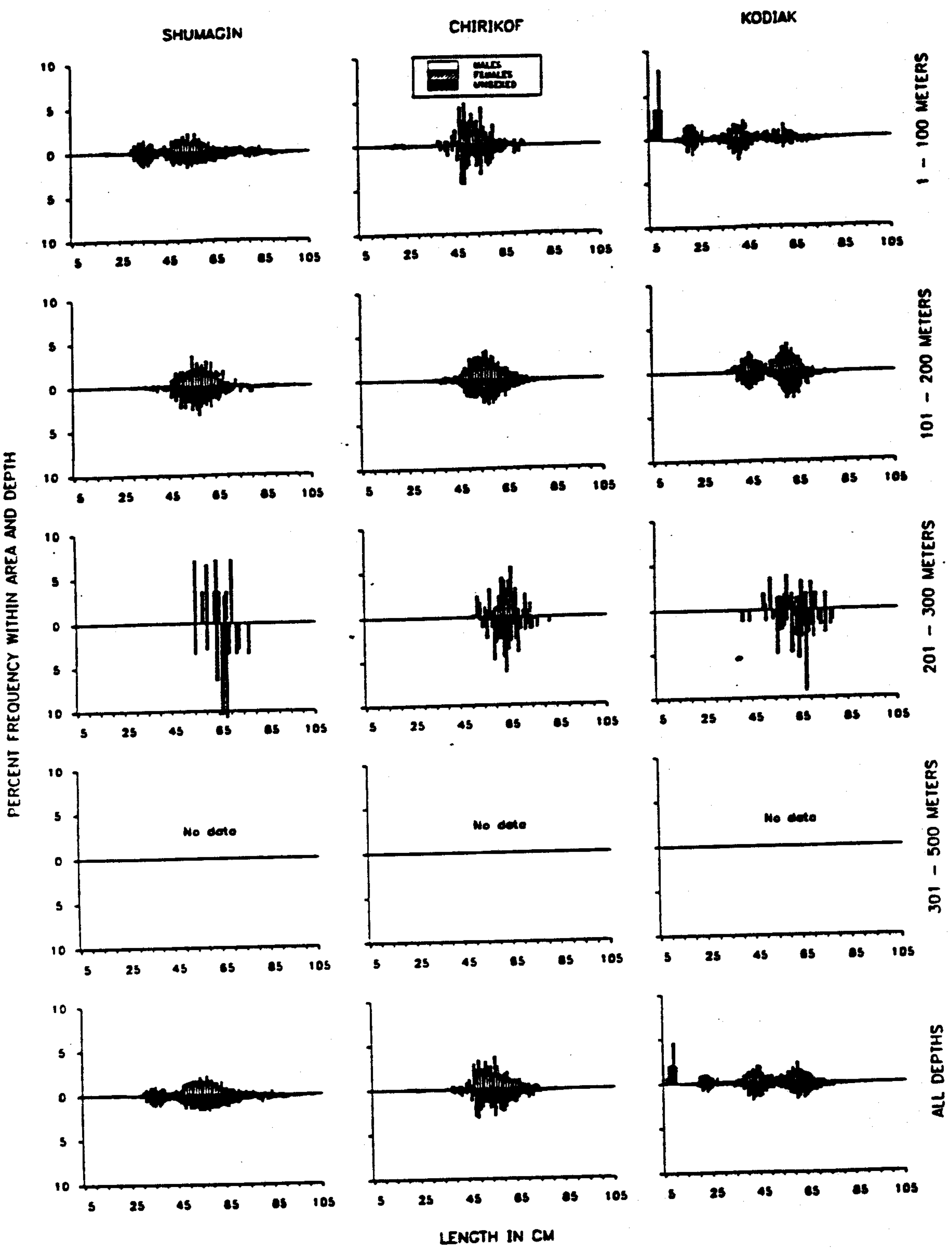
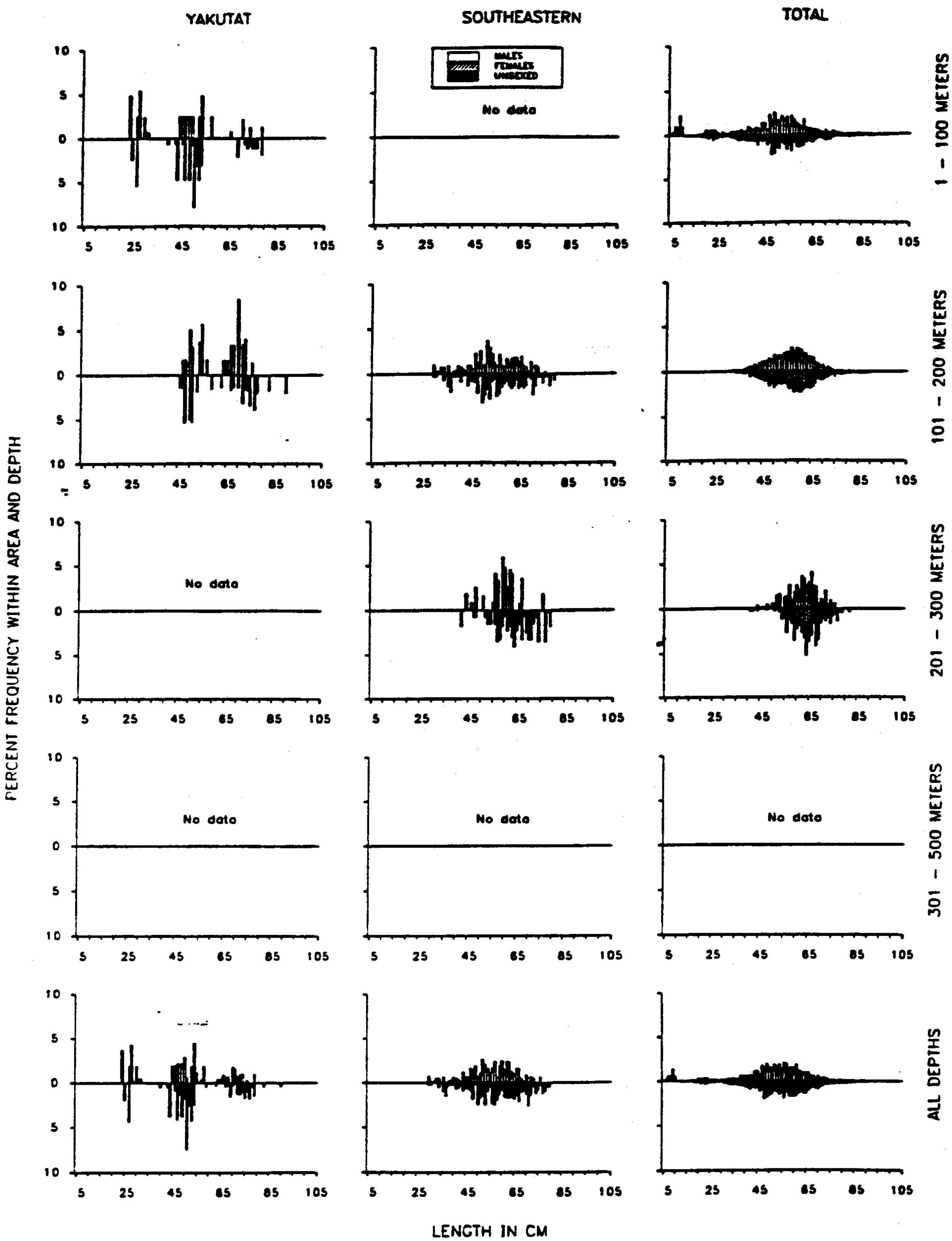


Figure 3-40. Pacific cod length composition from the NMFS 1990 Gulf of Alaska groundfish bottom trawl survey by INPFC statistical area and depth.



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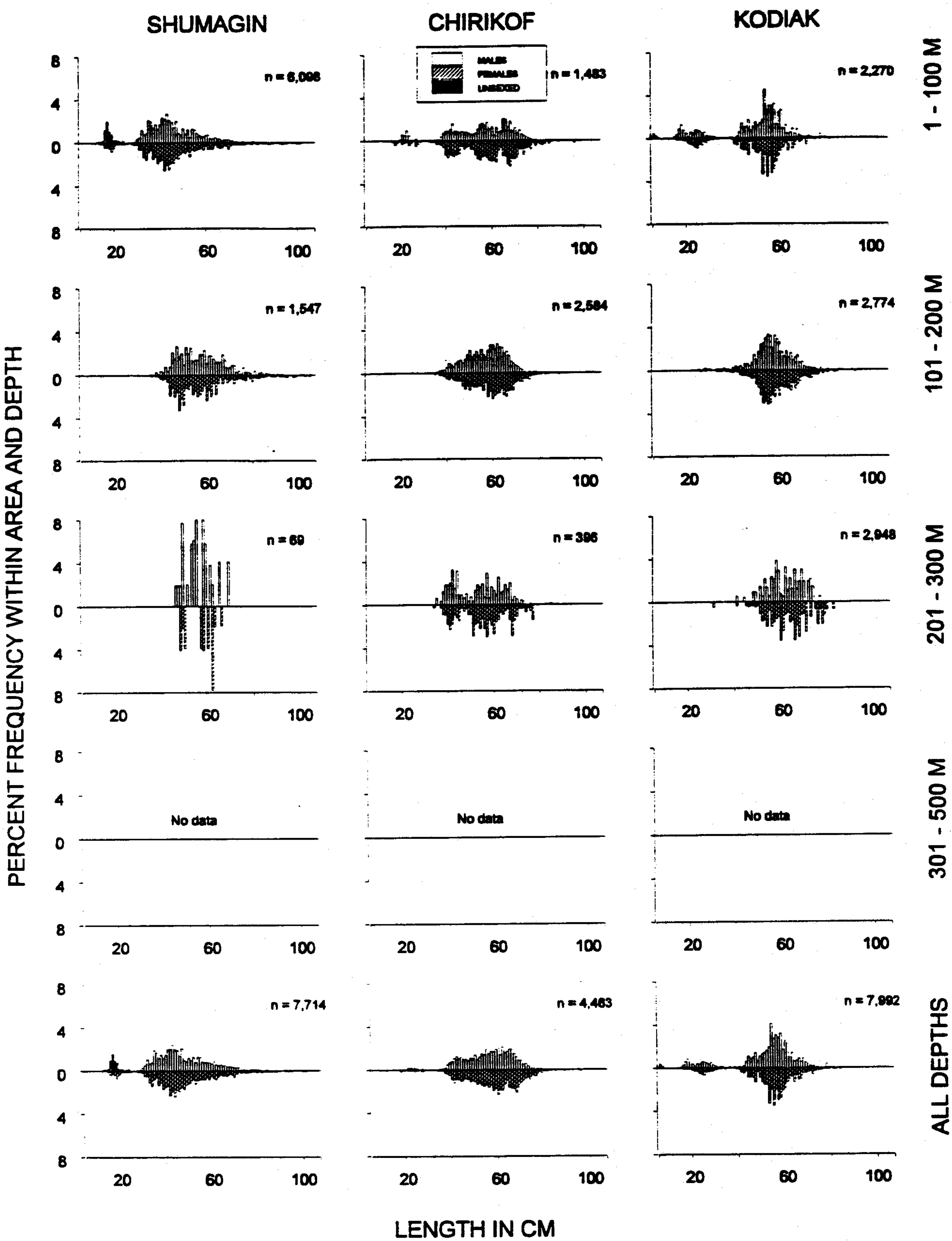


Figure 3-41. Size composition of Pacific cod from the 1993 Gulf of Alaska survey.

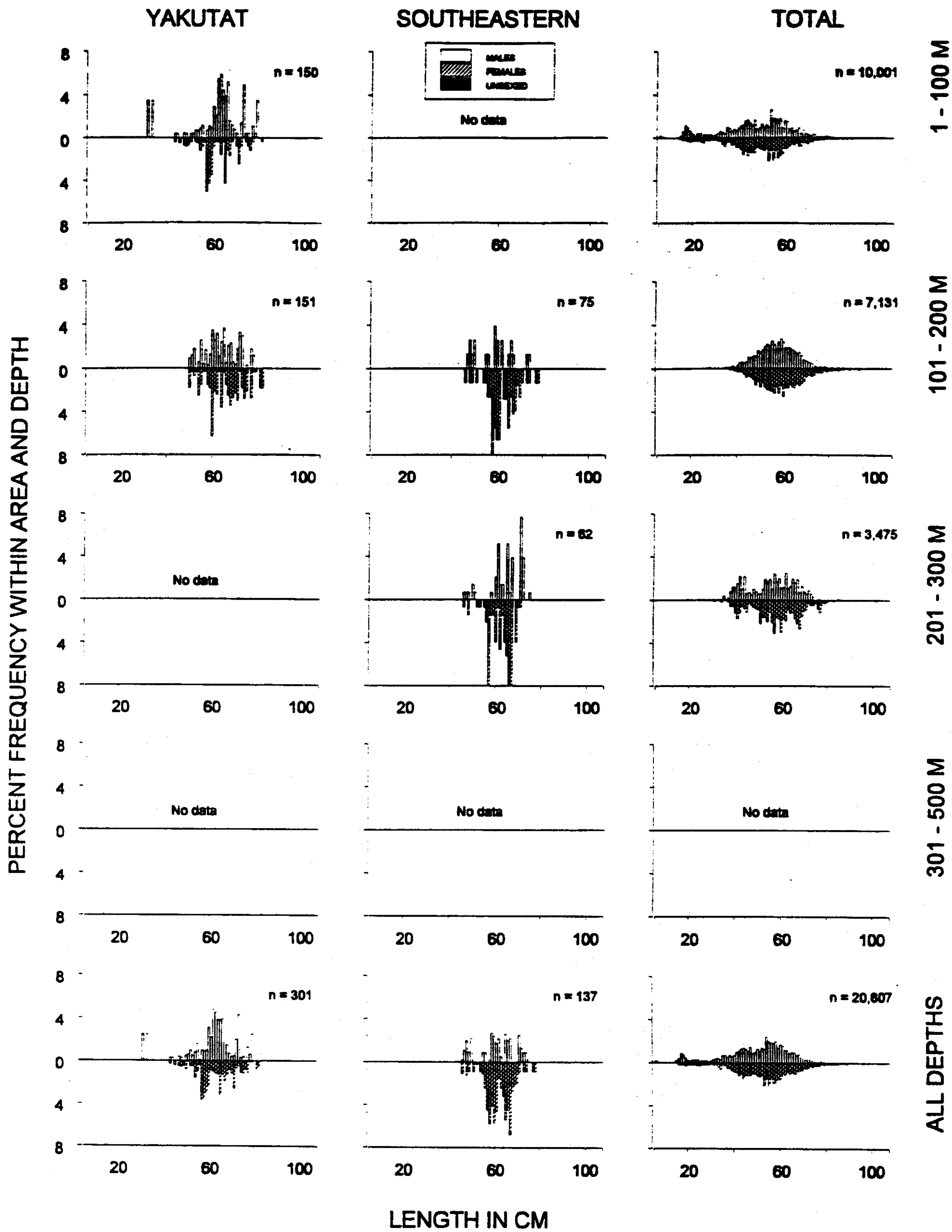


Figure 3-41.--Continued

Table 3-9. Total number of survey hauls, hauls containing Pacific cod, estimated CPUE, biomass, mean weight and mean length based on the 1990 Gulf of Alaska groundfish survey, by International North Pacific Fisheries Commission statistical areas and depth intervals.

Area	Depth (m)	Number of trawl hauls	Hauls with catch	CPUE (kg/km²)	Biomass (t)	Mean weight (kg)	Mean length (cm)
Shumagin	1 - 100	75	63	2,360	104,709	2.6	55.4
	101 - 200	46	42	1,930	28,054	2.5	58.6
	201 - 300	9	5	342	937	2.2	65.2
	301 - 500	7	1	6	16	1.8	—
	All depths	137	111	2,084	133,715	2.6	56.1
Chirikof	1 - 100	28	24	2,926	77,762	1.6	52.9
	101 - 200	106	93	2,705	64,250	2.2	57.7
	201 - 300	16	13	1,169	13,440	3.0	63.9
	301 - 500	4	0	0	0	—	—
	All depths	154	130	2,450	155,452	1.9	55.3
Kodiak	1 - 100	51	41	1,048	41,767	1.1	36.6
	101 - 200	129	111	1,240	53,565	2.2	56.8
	201 - 300	29	18	415	4,789	3.0	63.8
	301 - 500	6	0	0	0	—	—
	All depths	215	170	1,027	100,121	1.6	44.9
Yakutat	1 - 100	17	16	490	8,251	1.7	48.1
	101 - 200	56	33	206	5,993	2.9	62.5
	201 - 300	36	6	49	238	1.9	—
	301 - 500	25	0	0	0	—	—
	All depths	134	55	269	14,482	2.1	51.2
Southeastern	1 - 100	0	0	0	0	—	—
	101 - 200	23	19	701	6,921	1.8	55.2
	201 - 300	27	20	666	3,352	2.5	62.1
	301 - 500	18	3	10	29	1.7	—
	All depths	68	42	579	10,303	2.0	56.9
All areas	1 - 100	171	144	1,822	232,489	1.8	48.8
	101 - 200	360	298	1,318	158,784	2.3	57.5
	201 - 300	117	62	638	22,755	2.9	63.6
	301 - 500	60	4	3	44	1.7	—
	All depths	708	508	1,395	414,072	2.0	52.3

All areas biomass, 95% confidence interval: 289,070 - 539,074 metric tons (t)

Table 3-10. Total number of survey hauls, hauls containing Pacific cod, estimated CPUE, biomass, mean weight and mean length based on the 1993 Gulf of Alaska groundfish survey, by INPFC statistical areas and depth intervals.

Area	Depth (m)	Number of trawl hauls	Hauls with catch	CPUE (kg/km^2)	Biomass (t)	Mean weight (kg)	Mean length (cm)
Shumagin	1 - 100	106	101	2,195	97,370	1.3	44.6
	101 200	51	51	1,833	26,639	2.4	57.7
	21 - 300	8	6	328	897	2.0	56.4
	301 - 500	6	0	0	0	---	---
	All	171	158	1,947	124,907	1.4	46.3
Chirikof	1 - 100	54	41	1,445	38,393	2.3	56.3
	101 - 200	81	68	2,107	50,030	2.3	57.9
	201 - 300	31	26	959	11,034	1.7	54.6
	301 - 500	6	1	27	44	2.0	---
	All	172	136	1,568	99,501	2.2	56.9
Kodiak	1 - 100	68	51	2,923	116,459	1.6	50.1
	101 - 200	134	112	1,267	54,716	2.3	57.9
	201 - 300	28	18	480	5,543	2.8	62.7
	301 - 500	10	0	0	0	---	---
	All	240	181	1,812	176,717	1.8	52.2
Yakutat	1 - 100	16	11	626	10,148	2.6	61.2
	101 - 200	61	27	177	5,058	2.8	65.2
	201 - 300	29	11	89	434	2.1	---
	301 - 500	18	0	0	0	---	---
	All	124	49	297	15,639	2.6	62.3
Southeastern	1 - 100	0	0	---	---	---	---
	101 - 200	24	11	341	3,363	2.4	61.2
	201 - 300	30	23	311	1,564	2.7	63.3
	301 - 500	14	1	1	4	1.4	---
	All depths	68	35	277	4,931	2.5	61.9
All areas	1 - 100	244	204	2,066	262,369	1.5	48.5
	101 - 200	351	269	1,165	139,806	2.3	58.2
	201 - 300	126	84	546	19,472	2.0	56.9
	301 - 500	54	2	4	48	2.0	---
	All	775	559	1,426	421,695	1.7	51.2

All areas biomass, 95% confidence interval: 254,318 - 589,072 metric tons

4 BASE CASE ASSESSMENT OF ECONOMIC AND SOCIAL INDICES

This chapter will focus on the human aspects of the EEZ pollock and GOA Pacific cod fisheries during the period of the inshore-offshore allocation (1992-1995). The "Base Case" is defined the current status of the industry. Because the industry as a whole is very dynamic, we do not assume that the base case is represented in any one year, rather we will try to depict the industry as it is evolving during this period. Markets for products will be examined as well as the producers and harvesters, although the focus will be on the processing sector.

4.1 DATA USED IN CHAPTERS 4, 5, AND 6

In this chapter and in Chapters 5 and 6, data from 1991 through 1994 are used. Information for 1995 is not yet available, and will not be considered directly in this assessment. We have also included data from 1991, the last full year without the inshore-offshore allocation for reference. Unless otherwise stated, retained catch and discard information come from "blend data." Blend data has been used since 1992 by NMFS/AKR for in-season management. It combines weekly processor report data and observer data to estimate total discard and retained catch of all processors. For 1991, we also use blend data although it was not officially used for the 1991 fishery. Blend data has been adopted for official use because it uses both the information provided by observers and by the processors themselves and avoids, to some degree, uncertainties generated by use of product recovery rates. All processed product data used in this report comes directly from the weekly reports submitted by each processor.

Product price data are reported by NMFS and ADF&G in quarterly and annual submissions. These data have been summarized in the "Economic Status of the Groundfish Fisheries of Alaska, 1994" [Kinoshita].

Harvests by catcher vessels delivering to shore-plants and some motherships come from Fish Ticket data submitted by processors to ADF&G. Data reporting catcher-vessel deliveries to motherships comes from NORPAC observer data, however, this is sample data and somewhat problematic. To date, there does not exist a single comprehensive source of catcher-vessel data and consequently catcher-vessel data used in this report will be limited.

4.2 PRICES

4.2.1 Product Prices for Pollock and Pacific Cod

Product prices are one of the key parameters driving the fishing industry in the North Pacific, and for that matter, all over the world. Understanding product markets and prices and their relationships with inventories, exchange rates and consumer preferences occupies the life's work of many economists. No comprehensive study has been completed to date on these relationships for pollock and Pacific cod in the North Pacific. An unpublished paper by economists at University of Alaska in Fairbanks documents this lack of information and then estimates a demand model for pollock surimi. While their model holds promise, it is still incomplete and does not attempt to examine prices for other products from pollock such as roe and fillets, nor does it examine Pacific cod prices.

Figure 4.1a shows the quarterly surimi export prices in $/kg for 1986-1993, as used in the U.A.F. study. Since 1986 the surimi prices have experienced two apparent structural breaks, one in 1989, which perhaps incidentally coincided with the early closure of the GOA pollock fishery. The second structural break, again perhaps coincidentally, occurs at the same time as the NPFMC's debates on the Inshore-Offshore Amendment. The high prices seen in 1991 were taken as the projected prices used in the "supplemental analysis." Obviously a drop in those prices following the implementation means that projected revenues and profit using the higher prices of the previous period will likely overstate the actual impacts of the allocation.

Figure 4.1a

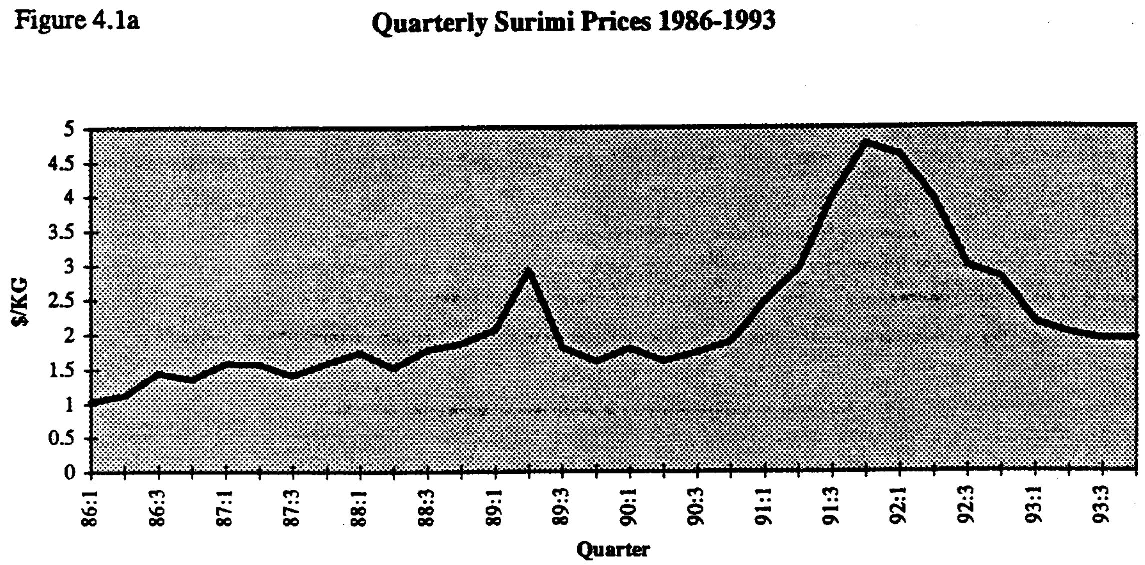
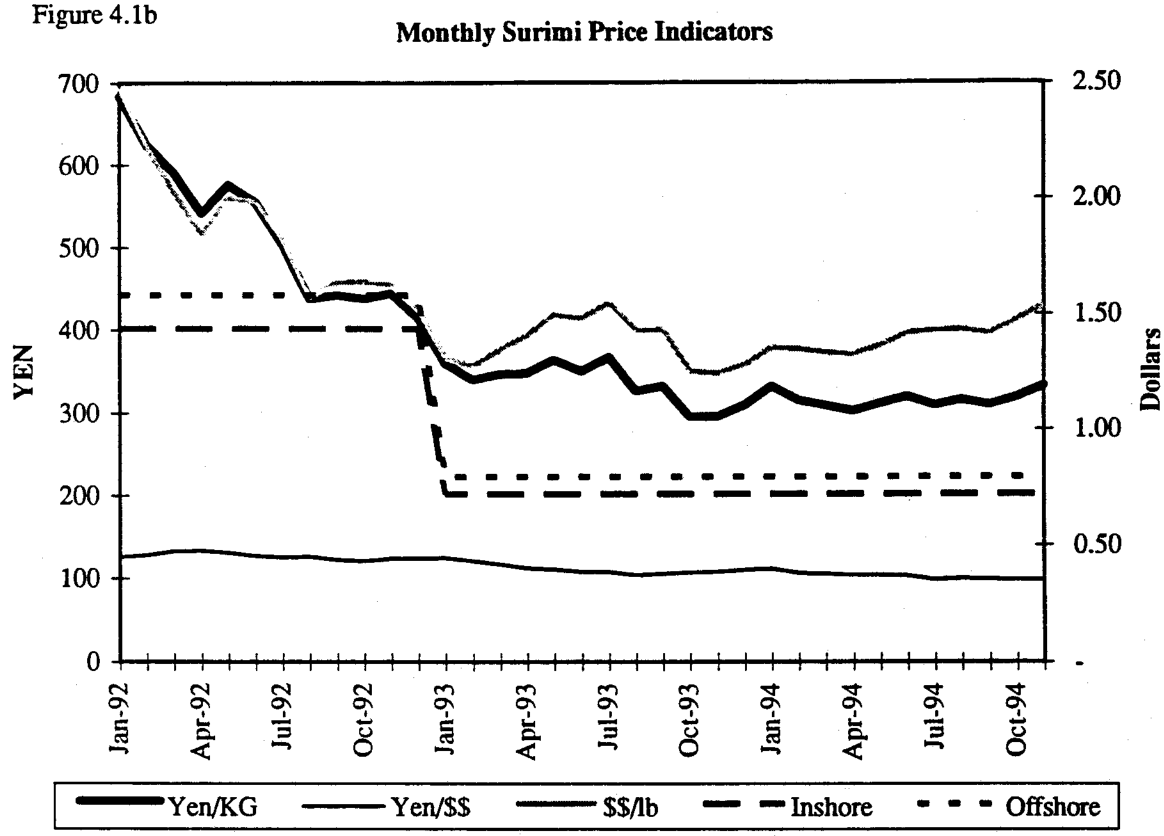


Figure 4.1b



For purposes of this document, we will incorporate product revenue reported to NMFS in quarterly processor reports. These reports summarize the gross revenue and quantity of products sold by the processors, using the same level of detail as reported in weekly processor reports. The data uniformly reports prices as FOB Dutch Harbor. NMFS has aggregated these data by inshore and offshore sectors for each reported product form for the years 1991-1993. Data for 1994 is not yet available. We took this data and further aggregated by products to obtain the data in Tables 4.1a and 4.1b which report prices for pollock and Pacific cod by inshore and offshore sector for the years 1991-1993 for aggregated products. Prices are listed in $/lb and $/mt using 2204.6 lbs/mt as a conversion factor from pounds to tons. The prices listed in these tables are weighted averages of the product revenues reported during the year. We multiplied the reported price by the reported pounds sold at that price. We then added together these gross revenues for each sector for the year and for each aggregated product, and divided by the total pounds in that product-sector. The result is an average price which takes into account the variation in product quantities, quality, and price changes within each year and aggregated product form.

The product aggregation we undertook was necessary not only for ease of reporting, but also to protect the confidentiality of the reports. The aggregation we used differed for cod and pollock. For pollock we combined all whole, bait, bled, headed, and or gutted products into the H&G category. Roe, surimi, and minced product were not aggregated. All forms of fillets, i.e., skinless, boneless, deepskin, etc., were aggregated into a single fillet product including split and salted product. All other products from pollock were aggregated into the meal/oil product form.

For Pacific cod the aggregation was somewhat different because there are many more product forms produced. We aggregated whole, bait, and bled into a whole product category, all head and/or gutted product forms into an H&G product, and all forms of fillets including split and salted into the fillet category. Roe was held in its own category, but all minced and reported surimi were combined into the mince category. Meal, oil, and bones were aggregated into a single meal category, and all other products such as cheek, chins, bellies, tongues, heads, milt, etc in the "other" category.

Figure 4.1b shows the effect of our assumption that a single price holds for a given product for the year. This figure shows the monthly Tokyo wholesale prices of surimi from January 1992 through November 1994 in the heavy solid black line. This data is taken from an updated version of Table 37 of the "Economic Status of the Groundfish Fisheries Off Alaska." This document was last released in December 1994 by NMFS. The yen-dollar exchange rate for the same period is shown with the thin solid black line. Applying the exchange rate to the yen wholesale price and converting to pounds, we obtained an equivalent price in $/lb. This line is the solid gray line. Note that this line uses the dollar scale on the right side of the graph. Finally, we have added the inshore and offshore prices we use in this report from Table 4.1. Since no product price data for 1994 is available from NMFS, we will assume 1993 prices for 1994. The inshore and offshore lines use the dollar scale on the right side of the figure.

A quick look at this figure shows volatility of surimi price in the Tokyo wholesale market compared to the lack of variation we use in this study. The figure also shows that, relative to the yen price, the steadily declining exchange rate has improved the price U.S. operators receive. We also can surmise the impact of applying 1993 surimi prices to 1994 production. Since January 1993, both the yen wholesale price and the dollar wholesale prices have varied within a relatively narrow band, and compared to the drop in prices from 1992, they have remained flat. Thus, we do not feel that the use of 1993 surimi prices does much damage to the overall analysis. It does however further detract from overall level of precision with which we are able to make projections.

Table 4.1a

Product Prices For Pollock 1991-1993								
Year	Sector	Units	H & G	Roe	Fillets	Surimi	Minced	Meal/Oil
1991	Inshore	$/lb.	$ 0.263	$ 3.748	$ 1.336	$ 1.266	$ 0.701	$ 0.218
		$/mt.	$ 580.19	$ 8,262.84	$ 2,945.10	$ 2,791.02	$ 1,545.42	$ 481.39
	Offshore	$/lb.	$ 0.367	$ 4.649	$ 1.361	$ 1.576	$ 0.710	$ 0.250
		$/mt.	$ 809.15	$ 10,249.19	$ 3,001.15	$ 3,474.45	$ 1,565.27	$ 551.15
1992	Inshore	$/lb.	$ 0.499	$ 4.281	$ 1.209	$ 1.435	$ 0.383	$ 0.205
		$/mt.	$ 1,100.30	$ 9,437.89	$ 2,664.91	$ 3,163.60	$ 844.36	$ 452.32
	Offshore	$/lb.	$ 0.284	$ 5.509	$ 1.217	$ 1.581	$ 0.521	$ 0.245
		$/mt.	$ 625.83	$ 12,145.14	$ 2,682.77	$ 3,485.47	$ 1,148.60	$ 540.13
1993	Inshore	$/lb.	$ 0.344	$ 3.607	$ 1.035	$ 0.718	$ 0.393	$ 0.195
		$/mt.	$ 757.84	$ 7,951.99	$ 2,281.92	$ 1,582.90	$ 866.41	$ 429.21
	Offshore	$/lb.	$ 0.128	$ 5.119	$ 1.130	$ 0.798	$ 0.391	$ 0.223
		$/mt.	$ 283.09	$ 11,285.35	$ 2,491.39	$ 1,759.27	$ 862.00	$ 491.63

Table 4.1b

Product Prices For Pacific Cod 1991-1993									
Year	Sector	Units	Whole	H & G	Fillets	Roe	Other	Minced	Meal/Oil
1991	Inshore	$/lb.	$ 0.551	$ 0.796	$ 1.922	$ 0.722	$ 1.045	$ 0.647	$ 0.217
		$/mt.	$ 1,214.97	$ 1,755.52	$ 4,238.07	$ 1,591.72	$ 2,303.80	$ 1,425.88	$ 477.89
	Offshore	$/lb.	$ 0.433	$ 0.925	$ 2.239	$ 0.857	$ 0.557	$ 0.695	$ 0.297
		$/mt.	$ 955.26	$ 2,039.15	$ 4,935.04	$ 1,889.34	$ 1,227.71	$ 1,532.20	$ 654.74
1992	Inshore	$/lb.	$ 0.465	$ 0.779	$ 1.808	$ 0.758	$ 1.252	$ 0.676	$ 0.231
		$/mt.	$ 1,025.58	$ 1,716.73	$ 3,986.89	$ 1,671.09	$ 2,761.23	$ 1,489.39	$ 509.91
	Offshore	$/lb.	$ 0.399	$ 0.761	$ 2.038	$ 1.050	$ 0.858	$ 0.689	$ 0.232
		$/mt.	$ 880.49	$ 1,677.46	$ 4,492.31	$ 2,314.83	$ 1,891.74	$ 1,519.84	$ 511.47
1993	Inshore	$/lb.	$ 0.431	$ 0.492	$ 1.425	$ 0.829	$ 1.227	$ 0.372	$ 0.200
		$/mt.	$ 950.07	$ 1,083.82	$ 3,140.99	$ 1,827.61	$ 2,705.35	$ 819.28	$ 441.43
	Offshore	$/lb.	$ 0.408	$ 0.745	$ 1.726	$ 0.989	$ 1.068	$ 0.369	$ 0.197
		$/mt.	$ 898.49	$ 1,642.49	$ 3,804.87	$ 2,180.35	$ 2,354.84	$ 813.50	$ 434.31

Table 4.2 examines the variation of major product prices for pollock used in this analysis and compares them to the prices which were assumed in the "Supplement Analysis." In the section of the table labeled, "Prices of Primary Pollock Product by Sector and Year," we show the price per pound of roe, fillets and surimi for the inshore and offshore sectors for the years 1991-1993. The right-most column contains the average of the "industry" and "NMFS" prices as used in the Supplemental Analysis for the Inshore-Offshore Amendment. The second section of Table 4.2 compares the estimated prices for 1991, 1992 and 1993 to those in the Supplemental analysis by calculating the absolute difference.

The third section shows these same prices as a percent of the 1991 prices. Using this, we can see the general trend of prices from year to year. Roe prices for example went up for both sectors in 1992, but fell in 1993 for the inshore sector to a level 96% of the 1991 prices. Comparing the 1991 prices to the supplemental prices, we see that the modeled prices were higher for the inshore fillets and surimi and higher than 1991 prices for offshore roe. We also notice that compared to 1992 and 1993 modeled fillet and surimi prices were significantly higher.

In the fourth section of Table 4.2, we show product prices as a percent of the surimi prices for the year and sector. Surimi is the dominant product form for both sectors, and this chart shows how prices have changed relative to each other. Compared to surimi prices, roe prices increased to some degree in 1992 and dramatically in 1993. Fillet prices fell relative to surimi in 1992 and then climbed above surimi prices in 1993.

Finally, the fifth section of the table shows the ratio of offshore prices to inshore prices. This table demonstrates the relative stability of price differences in the two sectors. For surimi, the 1991 offshore prices were 24% higher than in the inshore sector. This compares to a 10% to 12% range in the supplemental and in 1992 and 1993. Fillet prices were assumed lower for the offshore sector in the supplemental, but from 1991-1993 offshore prices have been higher than inshore, 9% higher in 1993. The roe price difference has trended toward the offshore sector but the supplement appears to have represented a reasonable split.

Table 4.3 goes through the same exercise for Pacific cod prices with the exception that the modeled prices are those used in the "Original SEIS" for the Inshore-Offshore Amendment. In that analysis, there was no price difference modeled between whole and H&G product. The price was assumed to be a weighted average of both product forms. Also, the only difference between sectors was in fillets. With regard to the Pacific cod prices for 1991-1993 compared to the pollock prices, there has been much less variation, and there has been a significant across the board decline in prices for all products in both sectors since 1991.

4.2.2 International Surimi Markets and Effects on Exvessel Price

During Council discussions of the inshore/offshore reauthorization, the issue of markets, prices, and market controls was identified as an area for possible examination. This section briefly addresses the issue of exvessel price for pollock relative to surimi export prices to Japan. Appendix V provides an econometric examination of this relationship, prepared by researchers from the University of Alaska Fairbanks, Department of Economics (Hermann et al 1994). As is reflected in the price data in the previous section, the Japanese were willing to pay much higher prices for surimi, beginning in mid-1991 and through 1992. Based on historical relationships between exvessel price and surimi export prices, it would be expected that a corresponding increase in exvessel price would occur. However, this did not occur in 1991 and 1992, though there is some indication that the relationship is trending back towards expectations, starting in 1993 when surimi prices returned to a point closer to pre-1991 levels.

The analysis in Appendix V is unable to attribute the structural break between exvessel price for pollock and export price of surimi to any specific cause, including the inshore/offshore allocation, which really did not take effect until 1993. It is possible that the uncertainty associated with the industry overall in 1991 and 1992 (with the inshore offshore allocation unresolved at that point) generated the higher export prices for surimi. This does not however explain the structural break in the surimi export prices relationship to exvessel pollock prices.

Table 4.2

Prices of Primary Pollock Products by Sector and Year								
		1991		1992		1993		Supplemental
Inshore Roe	$	3.748	$	4.281	$	3.607	$	3.790
Inshore Fillets	$	1.336	$	1.209	$	1.035	$	1.490
Inshore Surimi	$	1.266	$	1.435	$	0.718	$	1.365
Offshore Roe	$	4.649	$	5.509	$	5.119	$	5.125
Offshore Fillets	$	1.361	$	1.217	$	1.130	$	1.350
Offshore Surimi	$	1.576	$	1.581	$	0.798	$	1.535

Difference in Prices of Primary Products From Supplemental Prices								
		1991		1992		1993		Supplemental
Inshore Roe	$	(0.042)	$	0.491	$	(0.183)	$	-
Inshore Fillets	$	(0.154)	$	(0.281)	$	(0.455)	$	-
Inshore Surimi	$	(0.099)	$	0.070	$	(0.647)	$	-
Offshore Roe	$	(0.476)	$	0.384	$	(0.006)	$	-
Offshore Fillets	$	0.011	$	(0.133)	$	(0.220)	$	-
Offshore Surimi	$	0.041	$	0.046	$	(0.737)	$	-

Sector Prices of Pollock as a Percent of 1991Prices				
	1991	1992	1993	Supplemental
Inshore Roe	100.00%	114.22%	96.24%	101.12%
Inshore Fillets	100.00%	90.49%	77.48%	111.54%
Inshore Surimi	100.00%	113.35%	56.71%	107.82%
Offshore Roe	100.00%	118.50%	110.11%	110.24%
Offshore Fillets	100.00%	89.39%	83.01%	99.17%
Offshore Surimi	100.00%	100.32%	50.63%	97.40%

Sector Prices of Pollock as a Percent of Sector Surimi Price				
	1991	1992	1993	Supplemental
Inshore Roe	296.05%	298.33%	502.37%	277.66%
Inshore Fillets	105.52%	84.24%	144.16%	109.16%
Inshore Surimi	100.00%	100.00%	100.00%	100.00%
Offshore Roe	294.99%	348.45%	641.48%	333.88%
Offshore Fillets	86.38%	76.97%	141.61%	87.95%
Offshore Surimi	100.00%	100.00%	100.00%	100.00%

Offshore Prices Pollock as a Percent of Inshore Prices				
	1991	1992	1993	Supplemental
Roe	124.04%	128.68%	141.92%	135.22%
Fillets	101.90%	100.67%	109.18%	90.60%
Surimi	124.49%	110.17%	111.14%	112.45%

Table 4.3

Prices of Primary Pacific Cod Products by Sector and Year								
		1991		1992		1993		SEIS
Inshore Whole	$	0.551	$	0.433	$	0.399	$	0.520
Inshore H&G	$	0.796	$	0.925	$	0.761	$	0.520
Inshore Fillets	$	1.922	$	2.239	$	2.038	$	1.730
Offshore Whole	$	0.551	$	0.465	$	0.431	$	0.520
Offshore H&G	$	0.796	$	0.779	$	0.492	$	0.520
Offshore Fillets	$	1.922	$	1.808	$	1.425	$	1.850

Difference in Prices of Primary Products From SEIS Prices								
		1991		1992		1993		SEIS
Inshore Whole	$	0.031	$	(0.087)	$	(0.121)	$	-
Inshore H&G	$	0.276	$	0.405	$	0.241	$	-
Inshore Fillets	$	0.192	$	0.509	$	0.308	$	-
Offshore Whole	$	0.031	$	(0.055)	$	(0.089)	$	-
Offshore H&G	$	0.276	$	0.259	$	(0.028)	$	-
Offshore Fillets	$	0.072	$	(0.042)	$	(0.425)	$	-

Pacific Cod Sector Prices as a Percent of 1991Prices				
	1991	1992	1993	SEIS
Inshore Whole	100.00%	78.62%	72.47%	94.36%
Inshore H&G	100.00%	116.16%	95.55%	65.30%
Inshore Fillets	100.00%	116.45%	106.00%	89.99%
Offshore Whole	100.00%	84.41%	78.20%	94.36%
Offshore H&G	100.00%	97.79%	61.74%	65.30%
Offshore Fillets	100.00%	94.07%	74.11%	96.24%

Pacific Cod Sector Prices as a Percent of Sector Fillet Price				
	1991	1992	1993	SEIS
Inshore Whole	28.67%	19.36%	19.60%	30.06%
Inshore H&G	41.42%	41.32%	37.34%	30.06%
Inshore Fillets	100.00%	100.00%	100.00%	100.00%
Offshore Whole	28.67%	25.72%	30.25%	28.11%
Offshore H&G	41.42%	43.06%	34.51%	28.11%
Offshore Fillets	100.00%	100.00%	100.00%	100.00%

Pacific Cod Offshore Prices as a Percent of Inshore Prices				
	1991	1992	1993	SEIS
Whole	100.00%	107.36%	107.90%	100.00%
H&G	100.00%	84.19%	64.61%	100.00%
Fillets	100.00%	80.79%	69.92%	106.94%

4.3 PROCESSORS

Amendments 18 and 23 defined the inshore sector to include, "all shore based processing plants, all trawl catcher-processors and fixed gear catcher-processors whose product is the equivalent of less than 18 metric ton round-weight per day, and are less than 125 feet in length, and all motherships and floating processing vessels which process pollock in the BSAI or pollock and/or Pacific cod in the GOA at any time during the calendar year in the territorial sea of Alaska." Additionally, inshore motherships are limited to one location inside the territorial sea while processing pollock or Pacific cod. For catcher-processors, the implementing regulations require that NMFS examine the first weekly report submitted by catcher-processors less than 125' LOA in a directed fishery for Pacific cod in the GOA or pollock in the EEZ. Amendments 18 and 23 were implemented mid-way through 1992 and, therefore, most small catcher-processors had already submitted weekly reports; i.e., the sector to which they would belong was predetermined. In subsequent years, small catcher-processors were able to "choose" their sector by controlling their harvests in the first week of directed fishing.

For this analysis, we used the inshore-offshore flag included in 1992-1994 data from NMFS. For 1991, we supplied an inshore-offshore flag based on that processor's next year of participation. From 1991-1994 over 300 different processors have been identified in weekly processor reports or blend data as having handled either pollock or Pacific cod. A complete list of these processors is included in Appendix IV.

4.3.1 Processing Classes

As was done in the original Inshore-Offshore documents, we have classified processors into categories based on their physical attributes, processing capacity, and activities. A similar classification scheme was also used in the analysis the License Limitation Program, but in that case only those vessels which harvested were classified.

Shore Plants: Shore based processing facilities have been categorized based on the physical location of the plant. We have divided these locations into six regions and have designated plants from these regions accordingly. These are shown below: A total of 109 different processors was categorized as shore-plants.

SP1 A category was established for shore-plants located in Western Alaska, excluding Dutch Harbor/Unalaska and Akutan. During the 1991-1994, however, no SP1 plants as SP1 processed pollock or Pacific cod.

SP2 Shore-plants located in the Pribilofs and Aleutian Islands, excluding Dutch Harbor/Unalaska and Akutan. During the 1991-1994 period, fewer than three plants from this region reported pollock or Pacific cod, therefore, they have been aggregated with the plants in SP3.

SP3 Shore-plants located in Dutch Harbor/Unalaska and Akutan. A total of 8 plants (including SP2) processed pollock or P. cod during the period. This aggregate is listed as SP23 in the remainder of the document.

SP4 Shore-plants located on the southern coast of the Alaskan Peninsula. During 1991-1994, a total of five processors operated in this region. In some instances, we will combine these plants with other Gulf plants.

SP5 Shore-plants located on Kodiak Island or its environs. A total of 16 processors reported Pacific cod or pollock in this category.

SP6 Shore-plants located east of Kodiak including Cook Inlet, Prince William Sound and Southeast Alaska. A total of 49 plants reported pollock or Pacific cod in 1991-1994. Although the number of plants in this category is relatively large, their involvement in these particular fisheries is incidental for the most part.

UPP There were a total of 31 facilities which reported pollock or Pacific cod which we could not associate with a location or which only reported discards. We have categorized these as UPP standing for "unknown processing plant." These plants were designated as inshore because they reported catch using ADF&G processing identifying codes and did not have Federal Permits. These plants were insignificant participants but are included for completeness.

Motherships: As mentioned earlier, motherships could be designated as either inshore or offshore depending on whether the motherships chose to process at a single location inside Alaskan territorial waters. The classification scheme we have developed divided motherships between those that process crab (MP2) and those that do not (MP1). Some of the crab motherships (MP2) process limited amounts of pollock and Pacific cod and therefore, for this analysis, we have combined the two categories (MP12) although they represent vastly different capacities. A total of 35 motherships reported pollock and Pacific cod during 1991-1994. Of these, 14 were designated only as inshore motherships, 19 were strictly offshore, and 1 operated inshore in 1992 and offshore in 1993 and 1994.

Inshore Catcher-Processors: As mentioned earlier, catcher-processors less than 125' which processed less than 18 mt of round-weight/day in their first week of participation in a directed pollock or P. cod were classified as inshore catcher-processors (ICP). A total of 46 vessels were classified as ICP during the 1991-1994 period. These vessels used a wide variety of gear, including trawls, longlines and pots, and may have logically been classified into other categories. In this report, we have classified them as a single category to facilitate reporting.

Pot Cod/Crab Processors: These vessels are all designated as offshore vessels and used pots to catch Pacific cod and crab. They may also have used hook and line gear, but have not reported using trawls. There were 20 vessels in this pot cod/crab processing (PCP) category during the years 1991-1994. Any vessel which might have fit this category, but participated in the inshore fisheries, was categorized as ICP.

Longline Processors: This category consists of freezer longliners which have not reported using pots or trawls in the North Pacific. Any vessel which might have fit this category, but participated in the inshore fisheries, was categorized as ICP. There were 21 vessels in the longline processor (LP1) category during the 1991-1994 period.

Trawler Processors: We defined 3 types of trawler processors based on their processing activities and capacities:

TP1: Vessels which reported processing significant amounts of surimi were classified in the trawler-processor 1 (TP1) category. There were 24 vessels in this category.

TP2: Vessels which reported processing significant amounts of fillets which were > 150' were classified in the trawler-processor 2 (TP2) category. There were 16 vessels in this category. Length was included because the machinery for filleting generally requires vessels to be load-line stabilized. Some smaller vessels produced fillets, but usually much smaller amounts. We assumed these vessels to be filleting by hand.

TP3: These vessels all reported the use of trawl gear in the North Pacific. Many of these vessels have also reported the use of other gears such as longline and pots. These vessels produce primarily headed and gutted product and do not produce large amounts of fillets, and are generally less than 150' LOA. During the 1991-1994 period, 31 vessels fit into this category. Vessels which might have fit into this category, but which participated in the inshore sector, were classified as ICP.

Table 4.4 shows the number of reporting processors in each category for the years 1991-1994. The table demonstrates the dynamics of the processing industry in terms of entry and exit. The number of ICP vessels increased from 25 to 33 in 1992, while the number of PCP vessels dropped from 16 to 5 between 1992 and 1993. In that same year, the number of vessels in the TP3 class also dropped by five from 30 to 25, and the number of motherships dropped from 23 to 15. A similar decrease was seen in the SP6 which dropped from 42 to 33 between 1992 and 1994. From the table, it would be tempting to reach the conclusion that there has been a general fallout in the processing sectors. Bear in mind however, that each and every processor reporting even a single pollock or Pacific cod will show up in Table 4.4. It is likely that many of these processors were only marginally involved in the pollock and Pacific cod fisheries. This is almost certainly the case with the SP6 category because pollock and Pacific cod in the Eastern Gulf are relatively scarce. Other possible causes of changes in the number of processors include changes in reporting requirements. The complete list of processors shows that some processors are "unknown." Many of these "unknowns" are likely the result of the use of multiple sets of identifiers in the reported data.

Table 4.4 All Processor Reporting Pollock and Pacific Cod in the EEZ Off Alaska Between 1991-1994

	1991 Processors			1992 Processors			1993 Processors			1994 Processors		
Class	Inshore	Offshore	Total	Inshore	Offshore	Total	Inshore	Offshore	Total	Inshore	Offshore	Total
ICP	3	22	25	2	31	33	35	0	35	30	3	33
LP1	0	15	15	0	20	20	0	18	18	0	18	18
MP12	10	16	26	8	15	23	10	5	15	5	7	12
PCP	0	12	12	0	16	16	0	5	5	0	4	4
SP23	5	0	5	7	0	7	5	0	5	7	0	7
SP4	5	0	5	5	0	5	5	0	5	3	0	3
SP5	15	0	15	16	0	16	15	0	15	13	0	13
SP6	25	0	25	42	0	42	39	0	39	33	0	33
TP1	0	24	24	0	24	24	0	24	24	0	24	24
TP2	0	16	16	0	16	16	0	16	16	0	13	13
TP3	0	30	30	0	30	30	0	25	25	0	25	25
UPP	15	1	16	10	0	10	9	0	9	15	0	15
Total	78	135	214	90	152	242	118	93	211	106	94	200

Tables 4.5 and 4.6 show the number of "major" processors of Pacific cod and pollock respectively. These tables weed out the marginal or incidental processors by defining major processors as those which processed at least 0.1% of the EEZ-wide retained catch of the species in question. It's important not to infer too much from the information in these tables, particularly with regard to cause and effect relationship between the Inshore-Offshore Amendment and the number of major processors. This is particularly true of Table 4.5 which shows the number of major processors in the Pacific cod fishery. We have chosen to include Pacific cod processors from both the BSAI and the GOA even though the Amendment only applies to GOA. Nearly all major processors of Pacific cod receive fish from both areas, and clearly all mobile processors may switch between the two areas.

An examination of Table 4.5 reveals a fairly significant increase in the number of longline processors (LP1) in the Pacific cod fishery; from 14 in 1991 to 20 in 1994. We also see a big one-year increase in the number of pot processors (PCP) in 1992 when the number rose from 5 to 14 and then back to 3 in 1993. That same year also saw a doubling of the number of active major shore plants in the Eastern Gulf (SP6), although that number has since dropped back down. In Kodiak (SP5), the number of plants involved in Pacific cod drops from 11 in 1991 to 8 in 1992 and has remained fairly stable at that level. Other significant decreases came in the number of major mothership processors involved in Pacific cod as well as a decrease in the number of large trawler processors (TP1 and TP2). We would not expect that the TP1 classes would be heavily dependent on Pacific cod since these are primarily surimi vessels. The decrease in the fillet vessels (TP2) is more significant. Overall, it is clear that the number of major processors in the Pacific cod fisheries has declined from high levels in 1991 and 1992 to significantly lower levels in 1993 and 1994, with the exception of LP1s.

Several factors may enter into this decline, not the least of which may be the design of the table itself. Clearly our definition of "major" processors is subjective. Had we chosen 0.2% as a definition of "major" processors, the industry would appear to be much more stable than shown here. Another factor may be the decline in Pacific cod harvests in the North Pacific. This is evident in the decline in the threshold for "major" processors from 277 mt in 1991 to 181 mt in 1993. These numbers translate to a 35% decline in retained Pacific cod in the North Pacific over a two-year period. Pacific cod stocks are expected to increase in the next few years which could result in increases in the number of processors in the future. Product prices also play a major role in the number of active processors. As we noted earlier, product prices for Pacific cod experienced a general decline coincidental to the decline in harvests. This "double whammy" of declining prices and declining harvest would very likely create stress in the industry. Finally, it is possible that the Inshore-Offshore Amendment itself played a role in the number of processors, particularly in the mothership class where the strict definitions may have forced more marginal producers out of the industry from both sectors.

Table 4.5 Major Processors of Pacific Cod in the North Pacific Between 1991 and 1994

	Major 1991 Pacific Cod Processors			Major 1992 Pacific Cod Processors			Major 1994 Pacific Cod Processors			Major 1994 Pacific Cod Processors		
Class	Inshore	Offshore	Total	Inshore	Offshore	Total	Inshore	Offshore	Total	Inshore	Offshore	Total
ICP	0	13	13	0	15	15	16	0	16	16	1	17
LP1	0	14	14	0	18	18	0	18	18	1	19	20
MP12	10	8	18	5	8	13	5	0	5	3	2	5
PCP	0	5	5	0	14	14	0	3	3	1	3	4
SP23	4	0	4	5	0	5	4	0	4	5	0	5
SP4	4	0	4	4	0	4	4	0	4	2	0	2
SP5	11	0	11	8	0	8	9	0	9	8	0	8
SP6	3	0	3	7	0	7	6	0	6	5	0	5
TP1	0	16	16	0	11	11	0	11	11	0	9	9
TP2	0	14	14	0	16	16	0	14	14	0	9	9
TP3	0	23	23	0	28	28	1	22	23	0	22	22
UPP	2	0	2	1	0	1	0	0	0	1	0	1
Total	20	53	73	20	55	75	20	47	67	16	40	56
	Processed at least 277 mt of Retained Pacific Cod			Processed at least 258 mt of Retained Pacific Cod			Processed at least 181 mt of Retained Pacific Cod			Processed at least 207 mt of Retained Pacific Cod		

Table 4.5 shows much more stability in the pollock fisheries at least in terms of the number of major processors involved. In none of the classes does the number vary by more than three. Again, it is important to stress the danger of reading too much into these tables. For example, it appears that the same 24 vessels in TP1 have participated in each year included in the table. While this is in fact true, without additional information it is impossible to come to this conclusion with certainty; in any year there were an equal number of entries of new vessels as there were exits. Appendix IV, detailing participation by processor, sheds more light on this issue.

Table 4.6 Major Processors of Pollock in the North Pacific Between 1991 and 1994

	Major 1991 Pollock Processors			Major 1992 Pollock Processors			Major 1994 Pollock Processors			Major 1994 Pollock Processors		
Class	Inshore	Offshore	Total	Inshore	Offshore	Total	Inshore	Offshore	Total	Inshore	Offshore	Total
MP12	2	3	5	3	3	6	3	3	6	2	3	5
SP23	4	0	4	4	0	4	4	0	4	4	0	4
SP4	0	0	0	1	0	1	1	0	1	2	0	2
SP5	6	0	6	7	0	7	9	0	9	7	0	7
TP1	0	24	24	0	24	24	0	24	24	0	24	24
TP2	0	13	13	0	10	10	0	11	11	0	11	11
TP3	0	2	2	0	2	2	0	1	1	0	1	1
Total	12	42	54	15	39	54	17	39	56	15	39	54
	Processed at least 1,561 mt of Retained Pollock			Processed at least 1,385 mt of Retained Pollock			Processed at least 1,247 mt of Retained Pollock			Processed at least 1,279 mt of Retained Pollock		

4.4 GULF OF ALASKA PACIFIC COD

Amendment 23 allocated 90% of the Pacific cod in the Gulf of Alaska to the inshore sector. The remaining 10% was allocated to the offshore sector. Figure 4.2 shows the progression of the GOA Pacific cod harvest by week for the years 1991-1994. It appears that the harvest of Pacific cod is compressing into shorter seasons. It may be tempting to conclude that the shortening of the seasons is a direct result of the Inshore-Offshore Amendment. This is a fairly weak conclusion which must be tempered by other considerations. For example, it is likely that in 1991 a significant portion of the offshore effort on Pacific cod did not occur until after the pollock fishery was closed in area 61. It is also likely that the influx of ICP demonstrated in Table 4.5 above contributes to the compression of the seasons. Further, the TACs for Pacific cod in the GOA decreased from 77,900 mt in 1991 to 56,700 mt in 1993.

Table 4.7 shows the amount of total catch along with the amount of discards and retained catch by sector for the years 1991 through 1994. This table as well as many other tables in this and subsequent chapters is set up with a basic structure of three rows per item. The first row reports the actual amount in question, the second row reports the percentage of the total from that row, the third reports the percentage of the total in the column. As an example, the first row of data in Table 4.7 reports the Inshore sector harvest of Pacific cod in terms of discards, retained and total catch in metric tons. In 1991, the inshore sector discarded 490 tons, retained 61,827 tons for a total of 62,318 tons. The second row labeled "% of sector" represents the percent of the total in the row. Thus, the inshore sector's discards represented 0.79% of the total inshore sector Pacific cod harvest in 1991. The row labeled "% of GOA" shows the "column percent." The inshore sector's retained catch of 61,827 tons was 82.55% of the 74,899 tons retained in the GOA as a whole. Similarly, the inshore sector's total was 81.64% of the total catch of Pacific cod in the GOA.

Further examination of Table 4.7 shows that total harvests declined from 76,328 in 1991 to 48,095 in 1994. At the same time, the amount of discards reported in the GOA Pacific cod fishery increased on a percentage basis. From 1.8% in 1991, discards increased to 10.4% of total catch in 1993, then dropped back down to 6.81% in 1994. In 1992, the year before the Inshore-Offshore Amendment was implemented, the offshore sector accounted for 42% of the discards, while the onshore sector accounted for 57% of the discards. In the year following implementation, the proportion of discards to retained Pacific cod increases dramatically for the offshore sector. These are most likely "regulatory" discards caused by the requirement that the offshore sector may not retain amounts of Pacific cod when the directed fishery for that sector is closed.

The harvest splits to each sector are also significant. In 1991 and 1992, Pacific cod harvests occurred without the constraints of Inshore-Offshore. In those years, the "offshore" sector harvested 18% and 27% of all Pacific cod . In 1993 and 1994, the two years after the implementation of the Inshore-Offshore Amendment, the offshore sector harvested only 4% and 3% of the total respectively, rather than the 10% as allocated. This is a direct result of NMFS strategy of conservative management. Rather than open the Pacific cod offshore fishery for a very short period risking overfishing, they chose to implement the Inshore-Offshore Amendment in the GOA for Pacific cod by disallowing directed fishing on Pacific cod for the offshore sector for the entire year, and allowing the offshore fleet to take Pacific cod only as bycatch. An unfortunate result of this strategy appears to be the increased percentage of discards which result as offshore vessels try to stay below directed fishing standards.

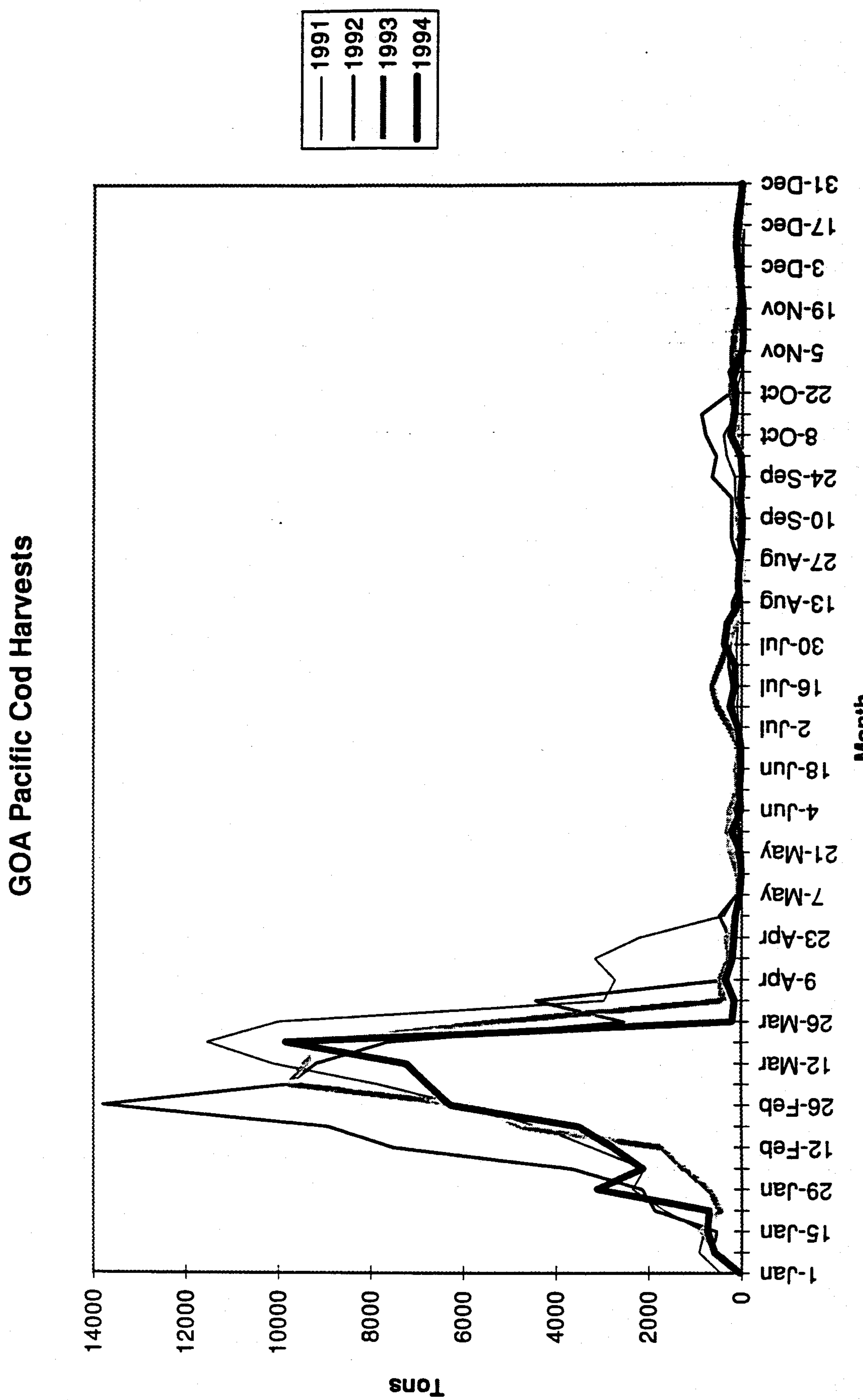

GOA Pacific Cod Harvests
1991
1992
1993
1994
Tons
14000
12000
10000
8000
6000
4000
2000
0
1-Jan
15-Jan
29-Jan
12-Feb
26-Feb
12-Mar
26-Mar
9-Apr
23-Apr
7-May
21-May
4-Jun
18-Jun
2-Jul
16-Jul
30-Jul
13-Aug
27-Aug
10-Sep
24-Sep
8-Oct
22-Oct
5-Nov
19-Nov
3-Dec
17-Dec
31-Dec
Month

Figure 4.2

Table 4.7

Gulf of Alaska Pacific Cod Discards, Retained, and Total Catch			
1991	Total Discard	Total Retained	Total Catch
Inshore Sector Total	490	61,827	62,318
% of Sector	0.79%	99.21%	100.00%
% of GOA	34.29%	82.55%	81.64%
Offshore Sector Total	939	13,071	14,010
% of Sector	6.70%	93.30%	100.00%
% of GOA	65.71%	17.45%	18.36%
GOA Total	1,429	74,899	76,328
% of GOA	1.87%	98.13%	100.00%
1992			
Inshore Sector Total	2,179	56,536	58,716
% of Sector	3.71%	96.29%	100.00%
% of GOA	57.81%	74.09%	73.32%
Offshore Sector Total	1,590	19,776	21,366
% of Sector	7.44%	92.56%	100.00%
% of GOA	42.19%	25.91%	26.68%
GOA Total	3,769	76,311	80,081
% of GOA	4.71%	95.29%	100.00%
1993			
Inshore Sector Total	4,643	49,693	54,335
% of Sector	8.54%	91.46%	100.00%
% of GOA	78.89%	98.21%	96.20%
Offshore Sector Total	1,242	904	2,146
% of Sector	57.88%	42.12%	100.00%
% of GOA	21.11%	1.79%	3.80%
GOA Total	5,885	50,596	56,481
% of GOA	10.42%	89.58%	100.00%
1994			
Inshore Sector Total	2,647	43,856	46,502
% of Sector	5.69%	94.31%	100.00%
% of GOA	80.84%	97.85%	96.69%
Offshore Sector Total	628	965	1,593
% of Sector	39.40%	60.60%	100.00%
% of GOA	19.16%	2.15%	3.31%
GOA Total	3,274	44,821	48,095
% of GOA	6.81%	93.19%	100.00%

Table 4.8 shows the GOA Pacific cod catch by gear for the inshore and offshore sectors in the years 1991-1994. The table uses the same general format as in Table 4.7, i.e., a three row format showing actual amounts followed by the "row percent" and the "column percent." From the table it is apparent that from 1992 forward the gear splits are stable with fixed gears taking ⅓ of the total catch, while trawl gear accounts for the remaining ⅔.

Table 4.8	Gulf of Alaska Pacific Cod Total Catch by Sector and Gear				
		Hook and Line	Pots	Trawl	Total
1991	Inshore Sector Total	5,527	10,299	46,481	62,307
	% Sector Total	8.87%	16.53%	74.60%	100.00%
	% GOA Gear Total	71.21%	98.43%	80.01%	81.64%
	Offshore Sector Total	2,234	164	11,612	14,010
	% Sector Total	15.95%	1.17%	82.88%	100.00%
	% GOA Gear Total	28.79%	1.57%	19.99%	18.36%
	GOA Total	7,761	10,464	58,093	76,317
	% GOA Total	10.17%	13.71%	76.12%	100.00%
1992	Inshore Sector Total	6,307	9,348	42,896	58,550
	% Sector Total	10.77%	15.97%	73.26%	100.00%
	% GOA Gear Total	40.37%	93.62%	78.99%	73.27%
	Offshore Sector Total	9,316	637	11,410	21,363
	% Sector Total	43.61%	2.98%	53.41%	100.00%
	% GOA Gear Total	59.63%	6.38%	21.01%	26.73%
	GOA Total	15,623	9,984	54,306	79,913
	% GOA Total	19.55%	12.49%	67.96%	100.00%
1993	Inshore Sector Total	8,596	9,708	36,029	54,332
	% Sector Total	15.82%	17.87%	66.31%	100.00%
	% GOA Gear Total	95.83%	100.00%	95.31%	96.20%
	Offshore Sector Total	374	-	1,772	2,146
	% Sector Total	17.43%	0.00%	82.57%	100.00%
	% GOA Gear Total	4.17%	0.00%	4.69%	3.80%
	GOA Total	8,970	9,708	37,801	56,478
	% GOA Total	15.88%	17.19%	66.93%	100.00%
1994	Inshore Sector Total	6,756	8,928	30,820	46,503
	% Sector Total	14.53%	19.20%	66.27%	100.00%
	% GOA Gear Total	96.80%	96.95%	96.59%	96.69%
	Offshore Sector Total	223	281	1,088	1,593
	% Sector Total	14.02%	17.66%	68.32%	100.00%
	% GOA Gear Total	3.20%	3.05%	3.41%	3.31%
	GOA Total	6,979	9,209	31,908	48,096
	% GOA Total	14.51%	19.15%	66.34%	100.00%

The definition of "inshore" in the Inshore-Offshore Amendment created some perhaps unexpected results. While the "inshore" sector has harvested and processed 96% of the GOA Pacific cod since the allocation went into effect, the inshore catcher-processors (ICP) have taken an increasing proportion of that total. This is shown in Table 4.9 which details the catch of the ICP vessels compared to the GOA total. In 1991 and 1992, the ICP fleet was designated as "offshore." Recall that the Inshore-Offshore Amendment went into effect in June 1992 after the bulk of the Pacific cod had been harvested in the GOA. In 1993 and 1994 the ICP vessels were designated in the inshore sector. In 1991, they accounted for only 2% of the GOA total. In 1992 this grew to 7% and in 1993 and 1994 to 10%. The hook and line proportion of the ICP fleet has stayed constant at 90% since 1992.

Table 4.9 Gulf of Alaska Pacific Cod Total Catch by "Inshore" Catcher Processor

			Hook and Line	Pots	Trawl	Total
1991	Offshore:ICP		1,516	-	14	1,529
		% Sector Total	99.11%	0.00%	0.89%	100.00%
		% GOA Gear Total	19.53%	0.00%	0.02%	2.00%
	GOA Total		7,761	10,464	58,093	76,317
		% GOA Total	10.17%	13.71%	76.12%	100.00%
1992	Offshore:ICP		5,428	-	598	6,026
		% Sector Total	90.07%	0.00%	9.93%	100.00%
		% GOA Gear Total	34.74%	0.00%	1.10%	7.54%
	GOA Total		15,623	9,984	54,306	79,913
		% GOA Total	19.55%	12.49%	67.96%	100.00%
1993	Inshore:ICP		5,247	-	559	5,806
		% Sector Total	90.37%	0.00%	9.63%	100.00%
		% GOA Gear Total	58.49%	0.00%	1.48%	10.28%
	GOA Total		8,970	9,708	37,801	56,478
		% GOA Total	15.88%	17.19%	66.93%	100.00%
1994	Inshore:ICP		4,114	4	483	4,601
		% Sector Total	89.43%	0.08%	10.49%	100.00%
		% GOA Gear Total	58.95%	0.04%	1.51%	9.57%
	GOA Total		6,979	9,209	31,908	48,096
		% GOA Total	14.51%	19.15%	66.34%	100.00%

Pacific cod is generally processed into two major product forms, headed and gutted and fillets. Additionally, lesser amounts are split and salted, minced, frozen whole, and sold as bait. There also appears to have been some attempts to produce surimi from Pacific cod. Ancillary products from Pacific cod are also produced, mainly roe, millet, cheeks, tongues bellies, heads, meal, oil and bones. Table 4.10 shows the production of various product forms from the GOA by sector for the years 1991, 1992, and 1994. Data for 1993 is not currently available. We have aggregated ancillary products including surimi with the exception of Roe and Meal into an "Other" column. Additionally, we have included salted cod in the Fillets category. Like earlier tables, we have used the "row percent / column percent" format. The row percent labeled "% of Sector Products" shows how much of the total sector products was consisted of that product. The column percent, labeled "% of Gulf Products," shows the percentage of the GOA total of each product produced by each sector. Comparing 1992 production, the last year of major offshore participation in the Pacific cod fishery, to 1994 production reveals a shift toward fillet production away from whole and headed and gutted product. This was expected as most of the offshore participants and the smaller inshore catcher-processors (ICP) are unable to carry the necessary machinery to produce fillets.

Table 4.10

		Gulf of Alaska Pacific Cod Processed Products							
		Whole	H & G	Fillets	Roe	Other	Minced	Meal/Oil	Total
1991	Inshore	10,752	6,877	9,908	763	428	1,402	233	30,362
	% of Sector Products	35.41%	22.65%	32.63%	2.51%	1.41%	4.62%	0.77%	100.00%
	% of Gulf Product	83.94%	65.33%	92.81%	96.45%	99.43%	97.51%	70.80%	82.06%
	Offshore	2,057	3,649	767	28	2	36	96	6,636
	% of Sector Products	31.00%	54.99%	11.56%	0.42%	0.04%	0.54%	1.45%	100.00%
	% of Gulf Product	16.06%	34.67%	7.19%	3.55%	0.57%	2.49%	29.20%	17.94%
	GOA Total	12,809	10,527	10,675	791	430	1,438	329	36,998
	% of Gulf Total	34.62%	28.45%	28.85%	2.14%	1.16%	3.89%	0.89%	100.00%
1992	Inshore	8,143	3,041	9,462	1,150	722	1,034	432	23,983
	% of Sector Products	33.95%	12.68%	39.45%	4.79%	3.01%	4.31%	1.80%	100.00%
	% of Gulf Product	86.55%	27.65%	97.32%	91.55%	93.12%	99.72%	97.11%	71.29%
	Offshore	1,265	7,957	260	106	53	3	13	9,658
	% of Sector Products	13.10%	82.39%	2.69%	1.10%	0.55%	0.03%	0.13%	100.00%
	% of Gulf Product	13.45%	72.35%	2.68%	8.45%	6.88%	0.28%	2.89%	28.71%
	GOA Total	9,409	10,998	9,722	1,256	775	1,037	445	33,641
	% of Sector Products	27.97%	32.69%	28.90%	3.73%	2.30%	3.08%	1.32%	100.00%
1994	Inshore	3,435	2,835	6,638	1,060	440	937	159	15,504
	% of Sector Products	22.16%	18.29%	42.81%	6.84%	2.84%	6.04%	1.02%	100.00%
	% of Gulf Product	97.53%	88.76%	99.96%	99.88%	99.39%	100.00%	100.00%	97.16%
	Offshore	87	359	3	1	3	-	-	453
	% of Sector Products	19.23%	79.33%	0.56%	0.29%	0.59%	0.00%	0.00%	100.00%
	% of Gulf Product	2.47%	11.24%	0.04%	0.12%	0.61%	0.00%	0.00%	2.84%
	GOA Total	3,522	3,194	6,640	1,062	442	937	159	15,957
	% of Gulf Total	22.08%	20.02%	41.61%	6.65%	2.77%	5.87%	1.00%	100.00%

Table 4.11 (same as Table 4.3 previously introduced) shows Fillet, H&G, and Whole product prices for Pacific cod from 1991-1993. Data for 1994 is currently unavailable. Generally, prices have shown a decrease since 1991. However, with the crash of the Atlantic cod stocks, these are expected to rebound. The second section of Table 4.11 shows the absolute changes from the prices used in the SEIS. The third part of this table shows the percentage reductions in prices over the 1991-1993 period. From this information, we see that the price decrease seen between 1991 and 1993 for the inshore sector was significantly larger for H&G than for fillets or whole fish (61.74% of 1991 prices vs 74.11% and 78.2% respectively). The prices for the offshore sector followed the same trends. The fourth section of the table illustrates the relationship between fillet prices and the other product forms; the other product forms are generally worth about a third of what fillets are worth. The final section of the table compares offshore prices to inshore prices and shows that offshore prices are higher for H&G and fillets, but relatively lower for whole fish.

Table 4.12 combines the prices in Table 4.11 with the processed product information in Table 4.10 to provide estimates of gross revenues for each sector for the years 1991, 1992 and 1994. Since we did not have 1994 prices or 1993 products, we applied 1993 prices to 1994 production, and therefore the results should be viewed with caution. The percentage revenue that each product form contributes to overall revenues is presented in the row titled "% of sector products." This table uses the same "row percent/column percent" format of earlier tables. For example, the 86.92% shown in "% of Gulf product," under the "Whole" heading for the inshore sector, means that the inshore sector accounted for 86.92% of the overall value of "whole" product for that year (and the offshore sector accounted for the remaining 13.08%).

Though various product forms are described, it is evident that fillets contribute the highest percentage towards overall revenues for the inshore sector in all years (58.78% of revenues in 1991, 66.22% in 1992, and 66.93% in 1994). For the offshore sector, H&G was the primary product in terms of contribution to total revenues, accounting for 55.67% in 1991, 83.48% in 1992, and 85.86% in 1994. In terms of the relative share of overall GOA P. cod revenues by sector, the offshore share ranged from 15.76% in 1991 to 21.91% in 1992, and then dropped to 2.16% in 1994 under the inshore/offshore program. This percentage is consistent with the overall percentage of the catch taken by the offshore fleet in 1993 and 1994.

Table 4.13 combines gross revenues from Table 4.12 and total catch from Table 4.9 to estimate gross revenue for total catch from the products for which we have prices. The combination of falling harvests and declining prices overwhelms any gains that might have been expected from a shift to higher valued fillets in the product mix of the inshore fleet. Until prices or harvests rebound, this sector of the industry will likely face hard times. Revenue per mt is much lower in 1994 than in 1991 or 1992 for both sectors. The revenue per mt is however higher for the inshore sector than the offshore sector in each year, which indicates a higher overall yield from the P. cod quota resulting from the inshore allocation of 90% of the quota. The differential between the two sector's revenues per mt is even higher in 1994, though some of that could be attributable to the fact that the offshore sector may have been forced to discard catch under the rules of the allocation. A further discussion of the impacts of the ICP vessel category, including the issue of expanding the definition to include all freezer/longliners, is contained in Chapter 6 where we discuss the impacts of continuing the inshore/offshore processing allocation for an additional three years.

Table 4.11

Prices of Primary Pacific Cod Products by Sector and Year							
		1991		1992		1993		SEIS
Inshore Whole	$	0.551	$	0.433	$	0.399	$	0.520
Inshore H&G	$	0.796	$	0.925	$	0.761	$	0.520
Inshore Fillets	$	1.922	$	2.239	$	2.038	$	1.730
Offshore Whole	$	0.551	$	0.465	$	0.431	$	0.520
Offshore H&G	$	0.796	$	0.779	$	0.492	$	0.520
Offshore Fillets	$	1.922	$	1.808	$	1.425	$	1.850

Difference in Prices of Primary Products From SEIS Prices								
		1991		1992		1993		SEIS
Inshore Whole	$	0.031	$	(0.087)	$	(0.121)	$	-
Inshore H&G	$	0.276	$	0.405	$	0.241	$	-
Inshore Fillets	$	0.192	$	0.509	$	0.308	$	-
Offshore Whole	$	0.031	$	(0.055)	$	(0.089)	$	-
Offshore H&G	$	0.276	$	0.259	$	(0.028)	$	-
Offshore Fillets	$	0.072	$	(0.042)	$	(0.425)	$	-

Pacific Cod Sector Prices as a Percent of 1991Prices				
	1991	1992	1993	SEIS
Inshore Whole	100.00%	78.62%	72.47%	94.36%
Inshore H&G	100.00%	116.16%	95.55%	65.30%
Inshore Fillets	100.00%	116.45%	106.00%	89.99%
Offshore Whole	100.00%	84.41%	78.20%	94.36%
Offshore H&G	100.00%	97.79%	61.74%	65.30%
Offshore Fillets	100.00%	94.07%	74.11%	96.24%

Pacific Cod Sector Prices as a Percent of Sector Fillet Price				
	1991	1992	1993	SEIS
Inshore Whole	28.67%	19.36%	19.60%	30.06%
Inshore H&G	41.42%	41.32%	37.34%	30.06%
Inshore Fillets	100.00%	100.00%	100.00%	100.00%
Offshore Whole	28.67%	25.72%	30.25%	28.11%
Offshore H&G	41.42%	43.06%	34.51%	28.11%
Offshore Fillets	100.00%	100.00%	100.00%	100.00%

Pacific Cod Offshore Prices as a Percent of Inshore Prices				
	1991	1992	1993	SEIS
Whole	100.00%	107.36%	107.90%	100.00%
H&G	100.00%	84.19%	64.61%	100.00%
Fillets	100.00%	80.79%	69.92%	106.94%

Table 4.12

Gulf of Alaska Pacific Cod Gross Revenue	Whole	H & G	Fillets	Roe	Other	Minced	Meal/Oil	Total
1991 Inshore	$ 13,063,400	$ 12,073,403	$ 41,989,940	$ 1,213,687	$ 985,104	$ 1,998,792	$ 111,300	$ 71,435,626
% of Sector Products	18.29%	16.90%	58.78%	1.70%	1.38%	2.80%	0.16%	100.00%
% of Gulf Product	86.92%	61.87%	91.73%	95.81%	99.70%	97.33%	63.89%	84.24%
Offshore	$ 1,965,153	$ 7,441,056	$ 3,786,554	$ 53,072	$ 2,996	$ 54,745	$ 62,894	$ 13,366,471
% of Sector Products	14.70%	55.67%	28.33%	0.40%	0.02%	0.41%	0.47%	100.00%
% of Gulf Product	13.08%	38.13%	8.27%	4.19%	0.30%	2.67%	36.11%	15.76%
GOA Total	$ 15,028,553	$ 19,514,460	$ 45,776,494	$ 1,266,759	$ 988,099	$ 2,053,537	$ 174,194	$ 84,802,097
% of Gulf Total	17.72%	23.01%	53.98%	1.49%	1.17%	2.42%	0.21%	100.00%
1992 Inshore	$ 8,351,689	$ 5,220,246	$ 37,721,997	$ 1,921,081	$ 1,992,254	$ 1,540,031	$ 220,376	$ 56,967,675
% of Sector Products	14.66%	9.16%	66.22%	3.37%	3.50%	2.70%	0.39%	100.00%
% of Gulf Product	88.23%	28.12%	96.99%	88.66%	95.18%	99.72%	97.10%	78.09%
Offshore	$ 1,114,173	$ 13,347,211	$ 1,169,035	$ 245,650	$ 100,886	$ 4,347	$ 6,577	$ 15,987,879
% of Sector Products	6.97%	83.48%	7.31%	1.54%	0.63%	0.03%	0.04%	100.00%
% of Gulf Product	11.77%	71.88%	3.01%	11.34%	4.82%	0.28%	2.90%	21.91%
GOA Total	$ 9,465,862	$ 18,567,457	$ 38,891,031	$ 2,166,731	$ 2,093,141	$ 1,544,377	$ 226,954	$ 72,955,554
% of Sector Products	12.97%	25.45%	53.31%	2.97%	2.87%	2.12%	0.31%	100.00%
1994 Inshore	$ 3,263,854	$ 3,072,849	$ 20,848,933	$ 1,937,636	$ 1,189,515	$ 767,618	$ 70,129	$ 31,150,535
% of Sector Products	10.48%	9.86%	66.93%	6.22%	3.82%	2.46%	0.23%	100.00%
% of Gulf Product	97.66%	83.90%	99.95%	99.85%	99.47%	100.00%	100.00%	97.84%
Offshore	$ 78,186	$ 589,670	$ 9,702	$ 2,878	$ 6,311	$ -	$ -	$ 686,748
% of Sector Products	11.39%	85.86%	1.41%	0.42%	0.92%	0.00%	0.00%	100.00%
% of Gulf Product	2.34%	16.10%	0.05%	0.15%	0.53%	0.00%	0.00%	2.16%
GOA Total	$ 3,342,041	$ 3,662,519	$ 20,858,635	$ 1,940,514	$ 1,195,826	$ 767,618	$ 70,129	$ 31,837,283
% of Gulf Total	10.50%	11.50%	65.52%	6.10%	3.76%	2.41%	0.22%	100.00%

Table 4.13

Gulf of Alaska Pacific Cod Gross Revenue per MT of Total Catch			
	Gross Revenue	Total Catch	Gross Revenue per MT of Total Catch
1991			
Inshore Gross Revenue	$ 71,435,626	62,307	$ 1,146.51
Offshore Gross Revenue	$ 13,366,471	14,010	$ 954.06
GOA Gross Revenue	$ 84,802,097	76,317	$ 1,111.18
1992			
Inshore Gross Revenue	$ 56,967,675	58,550	$ 972.97
Offshore Gross Revenue	$ 15,987,879	21,363	$ 748.39
GOA Gross Revenue	$ 72,955,554	79,913	$ 912.93
1994			
Inshore Gross Revenue	$ 31,150,535	46,503	$ 669.86
Offshore Gross Revenue	$ 686,748	1,593	$ 431.22
GOA Gr oss Revenue	$ 31,837,283	48,096	$ 661.96

4.4.1 Comparison to Original SEIS

Our original analysis of the Inshore-Offshore Amendment, examined cost in the Pacific cod fisheries as part of an input-output analysis. In undertaking that analysis we developed cost and revenue projections using the "OMB Survey" which was based on 1989 information. No new cost information has become available since that time. The product prices used in the original input-output analysis were $1.73 for inshore Fillets, and $0.52 for H&G. The price differential between fillets and H&G in that analysis was $1.22. So under the original analysis, the shift from H&G to Fillets was estimated to have created greater gross revenue increases than actually occurred in 1993 and 1994. However, since that model also assumed a greater amount of offshore catch, the difference is probably insignificant.

Again, it important not to infer too much from this rather incomplete analysis. Obviously missing from the equation are cost data with which one could calculate net revenues and make some judgement regarding overall changes in efficiency. Since no new cost information has become available since the original analysis, and since that data is now six years old, we will not provide estimates of net revenues using the current data. However, at the time the original input-output analysis was done, the contribution to margin (net revenue) was greater for Fillets in both sectors than for H&G product.

4.4.2 Summary of the Examination of the Base Case for GOA the Pacific Cod Fishery

In summary, it appears that the Inshore-Offshore Amendment has caused the following:

1) A shift of Pacific cod catch from the "offshore" sector to "inshore" sectors of about 25% of the total.
2) An increase in overall discards of Pacific cod of about 3%.

Other changes have occurred in the Pacific cod fishery which are less strongly linked to the Inshore-Offshore Amendment because they may also have been driven by market prices.

1) A decrease in overall harvests.
2) A decrease in overall prices.
3) A shift from production of H&G product to Fillets.
4) A decrease in average revenue per ton of Pacific cod harvested.

4.5 GULF OF ALASKA POLLOCK

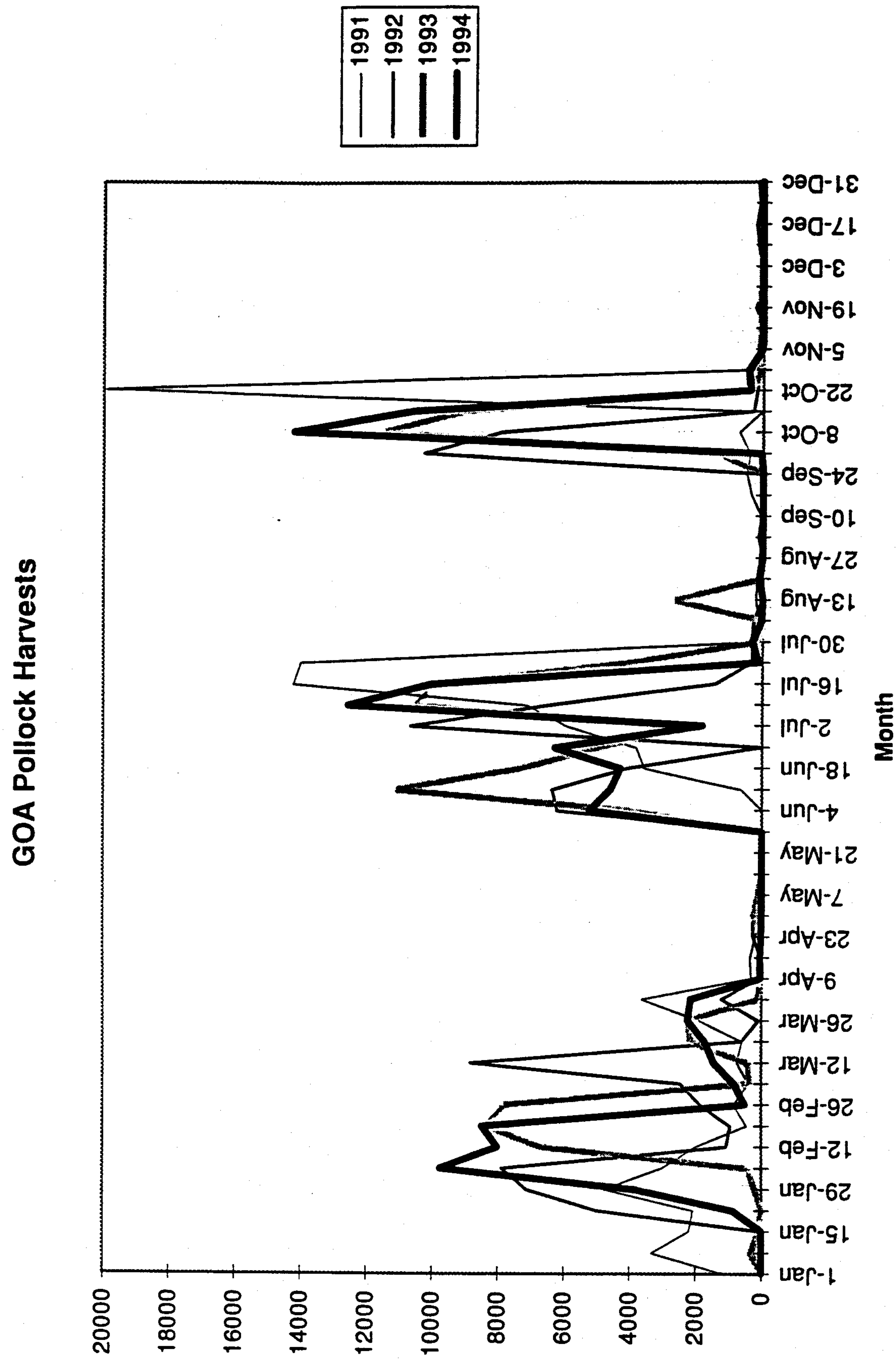
The Inshore-Offshore Amendment allocated 100% of the Gulf of Alaska pollock to the inshore sector. To a large degree, the inshore-offshore dispute came about because of an influx of catcher-processor activity in the GOA in the spring of 1989. That year, domestic catcher-processors fished heavily for roe bearing pollock and the fishery closed much earlier than expected. In 1988, shore based processors in the Gulf were able to process most of the pollock TAC because the Foreign and J.V. processors had been relegated to the BSAI. The few domestic catcher-processors had also chosen to concentrate their efforts in the BSAI where the TAC and biomass were higher. This led to the eventual ban on roe stripping and to seasonal allocations of the pollock TACs. In 1991, the Council and NMFS enacted quarterly apportionments for GOA pollock harvests along with a delay in the opening of the second apportionment, the latter of which was to prevent the influx of effort from BSAI to GOA pollock fisheries by coinciding with the BSAI 'B' season opening. Figure 4.3 shows the progression of Gulf pollock harvests by week in the years 1991-1994. The effect of the quarterly allocations with the second season delay is a tri-modal distribution of catch over time.

A careful examination of the figure reveals some broadening of seasons from 1991 to 1994. The most pronounced spike occurs in the fourth quarter of 1991, when nearly 20,000 tons was harvested in a single week. In later years, the fourth quarter allocation (the third mode) was harvested in periods lasting two weeks. Looking at the second and third quarters as a single mode reveals that in 1991 harvests grew steadily in the second quarter and then jumped as the third quarter apportionment was released. In 1992, 1993, and 1994, there are two distinguishable modes corresponding to each apportionment, with the second apportionment generally lasting longer than the third, which in each year has been harvested in two weeks. Harvests of the first quarter apportionment also show a mini bi-modal distribution. This occurs as areas are shut down generally progressing from west to east. Also evident is the delay of the trawl opening to January 20 which began in 1992.

Table 4.14 shows the GOA pollock harvests in the years from 1991-1994. These tables, constructed using blend data, show the total amount of pollock discarded, the amount retained and the total catch for each sector. These tables use the "row percent/column percent" format used in the previous section. The lines labeled, "% of Sector" give the percentage of the total sector catch accounted for by discards and retained pollock (i.e., the row percent). The lines labeled, "% of GOA" indicates the percentage of the GOA total of discard, retained, and total catches (i.e., the column percent).

These tables illustrate the impacts of the Inshore-Offshore Amendment in the Gulf. The offshore sector drops from 23% of the total catch in 1991 to 7% in 1992. Recall that the Inshore-Offshore Amendment was not implemented in the Gulf until after the end of the first quarterly allocation. In 1993 and 1994, the offshore total reflects only bycatch amounts, as 100% of the directed fishing for pollock was allocated inshore. In each of those years, the total offshore harvest of pollock in the GOA was about 1%.
Also of interest is the amount of discards in either sector. Discards in the inshore sector took a dramatic jump in 1992 from 5.7% to 14.4%. In 1993 and 1994, the percentage of discards dropped to 7.26% and 5.01%. The reason for the apparent jump in discards in 1992 is uncertain, however 55% of these occurred during the first quarterly apportionment, and an additional 22% occurred when directed fishing for pollock was finished.

Discards in the offshore sector in 1991 were 21%. This compares to offshore discards in the BSAI of 11% in the same year. Discards in the offshore sector increased as a percentage of total catch in 1992, 1993, and 1994 (ranging from 46% to 66%). Apparently, this is due to the fact that these vessels could not engage in directed fishing for pollock in the Gulf, and therefore were required by regulation to discard if their pollock catches exceeded certain levels.



GOA Pollock Harvests
1991
1992
1993
1994
Tons
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
1-Jan
15-Jan
29-Jan
12-Feb
26-Feb
12-Mar
26-Mar
9-Apr
23-Apr
7-May
21-May
4-Jun
18-Jun
2-Jul
16-Jul
30-Jul
13-Aug
27-Aug
10-Sep
24-Sep
8-Oct
22-Oct
5-Nov
19-Nov
3-Dec
17-Dec
31-Dec
Month

Figure 4.3

Table 4.14

Gulf of Alaska Pollock Discards, Retained, and Total Catch by Sector in 1991			
Sector Class	Total Discard	Total Retained	Total Catch
Inshore Sector Total	4,402	72,760	77,162
% of Sector	5.70%	94.29%	100.00%
% of GOA	47.29%	79.80%	76.79%
Offshore Sector Total	4,905	18,420	23,325
% of Sector	21.03%	78.97%	100.00%
% of GOA	52.71%	20.20%	23.21%
GOA Total	9,307	91,180	100,487
% of GOA	9.26%	90.74%	100.00%

Gulf of Alaska Pollock Discards, Retained, and Total Catch by Sector in 1992			
Sector Class	Total Discard	Total Retained	Total Catch
Inshore Sector Total	12,489	74,229	86,719
% of Sector	14.40%	85.60%	100.00%
% of GOA	80.00%	95.36%	92.80%
Offshore Sector Total	3,122	3,611	6,733
% of Sector	46.37%	53.63%	100.00%
% of GOA	20.00%	4.64%	7.21%
GOA Total	15,611	77,840	93,452
% of GOA	16.71%	83.29%	100.00%

Gulf of Alaska Pollock Discards, Retained, and Total Catch by Sector in 1993			
Sector Class	Total Discard	Total Retained	Total Catch
Inshore Sector Total	7,837	100,116	107,951
% of Sector	7.26%	92.74%	100.00%
% of GOA	94.85%	99.79%	99.41%
Offshore Sector	425	214	639
% of Sector	66.46%	33.54%	100.00%
% of GOA	5.14%	0.21%	0.59%
GOA Total	8,262	100,330	108,590
% of GOA	7.61%	92.39%	100.00%

Gulf of Alaska Pollock Discards, Retained, and Total Catch by Sector in 1994			
Sector Class	Total Discard	Total Retained	Total Catch
Inshore Sector Total	5,486	103,925	109,411
% of Sector	5.01%	94.99%	100.00%
% of GOA	86.22%	99.49%	98.73%
Offshore Sector Total	877	533	1,410
% of Sector	62.20%	37.80%	100.00%
% of GOA	13.78%	0.51%	1.27%
GOA Total	6,363	104,458	110,821
% of GOA	5.74%	94.26%	100.00%

Table 4.15 (a through d) below shows GOA pollock catch, including discards for various processor classes for 1991 through 1994. As noted in the previous table, the percentage of pollock taken by the inshore sector increased from 76.79% in 1991 to 92.80 % in 1992, reflective of the implementation of Amendment 18/23 in early 1992. A marked shift in the location of processing of these pollock occurred between inshore processing classes, with more of the pollock being processed in Kodiak in 1992 than in 1991. In 1991, 24.82% of GOA pollock were processed by SP2 and SP3 (located primarily in Dutch Harbor/Akutan), which equates to 32.32% of the inshore sector total. Their processing percentage in 1992 dropped to 10.69% overall which was 11.52% of the inshore sector total. The SP5 processors (primarily Kodiak plants) increased during the same period from 45.51% of the total (59.26% of the inshore sector total) in 1991 to 67% in 1992 (72.20% of the inshore sector total). Pollock processing activity in SP4 (Sand Point/King Cove area) also increased from 1% in 1991 to 5.44% in 1992. These trends continue into 1993 and 1994, with the combined SP4 and 5 processors accounting for 81 - 85% in those years.

Some trends in the offshore participation are worth examination, even though their participation overall is negligible after 1992. In 1991, prior to the allocations, this sector took 23.21% of the catch overall, which dropped to 7.21% in 1991 and to only 1% thereafter. Of the total taken by this sector in 1991, the majority was taken by TP1 vessels (larger factory trawlers mainly), with TP2 and TP1 taking most of the remainder. Vessels classified as Inshore Catcher Processors (ICPs) took only .19% in 1991, but their relative share of the harvest actually increased to 1.21% in 1992 for that sector, but dropped back down in 1993 and 1994, when they were actually fishing against the inshore quota. In either case, their participation was minimal as opposed to a much higher level of ICP participation exhibited in the GOA Pacific cod fisheries by the inshore sector.

Of the offshore sector vessels which participated in 1991 and 1992, only the TP3 category maintained its relative share of the catch from 1991 to 1992. This may provide an indication of which vessels might enter the GOA pollock once again, if the allocations are allowed to sunset in 1995. However, with the very small quotas in the GOA, it is questionable whether much, if any, of these offshore processor categories would re-enter the GOA pollock fisheries, given relatively more lucrative BSAI fisheries. If any of these vessels did re-enter the GOA fisheries, the quarterly allocated quotas of pollock would be taken in very short periods of time, and management of quota attainment would be extremely difficult.

Table 4.15a

Gulf of Alaska Pollock Discards, Retained, and Total Catch by Processor Class in 1991					
Sector	Class		Total Discard	Total Retained	Total Catch
Inshore	MP12		1,239	4,244	5,483
		% of Class	22.60%	77.40%	100.00%
		% of Sector	28.16%	5.83%	7.11%
		% of GOA	13.32%	4.65%	5.46%
	SP23		234	24,706	24,941
		% of Class	0.94%	99.06%	100.00%
		% of Sector	5.32%	33.96%	32.32%
		% of GOA	2.52%	27.10%	24.82%
	SP4		1,001	-	1,001
		% of Class	100.00%	0.00%	100.00%
		% of Sector	22.74%	0.00%	1.30%
		% of GOA	10.76%	0.00%	1.00%
	SP5		1,918	43,809	45,727
		% of Class	4.19%	95.81%	100.00%
		% of Sector	43.58%	60.21%	59.26%
		% of GOA	20.61%	48.05%	45.51%
	SP6		10	1	10
		% of Class	92.06%	7.94%	100.00%
		% of Sector	0.22%	0.00%	0.01%
		% of GOA	0.10%	0.00%	0.01%
Inshore Sector Total			4,402	72,760	77,162
		% of Sector	5.70%	94.29%	100.00%
		% of GOA	47.29%	79.80%	76.79%
Offshore	ICP		171	19	190
		% of Class	89.88%	10.12%	100.00%
		% of Sector	3.89%	0.03%	0.25%
		% of GOA	1.84%	0.02%	0.19%
	MP12		346	844	1,189
		% of Class	29.07%	70.93%	100.00%
		% of Sector	7.86%	1.16%	1.54%
		% of GOA	3.72%	0.93%	1.18%
	TP1		574	13,395	13,969
		% of Class	4.11%	95.89%	100.00%
		% of Sector	13.04%	18.41%	18.10%
		% of GOA	6.17%	14.69%	13.90%
	TP2		2,147	3,722	5,869
		% of Class	36.58%	63.42%	100.00%
		% of Sector	48.78%	5.12%	7.61%
		% of GOA	23.07%	4.08%	5.84%
	TP3		1,667	441	2,108
		% of Class	79.09%	20.91%	100.00%
		% of Sector	37.88%	0.61%	2.73%
		% of GOA	17.92%	0.48%	2.10%
Offshore Sector Total			4,905	18,420	23,325
		% of Sector	21.03%	78.97%	100.00%
		% of GOA	52.71%	20.20%	23.21%
GOA Total			9,307	91,180	100,487
		% of GOA	9.26%	90.74%	100.00%

Table 4.15b

Gulf of Alaska Pollock Discards, Retained, and Total Catch by Processor Class in 1992					
Sector	Class		Total Discard	Total Retained	Total Catch
Inshore	MP12		1,260	7,426	8,685
		% of Class	14.51%	85.49%	100.00%
		% of Sector	10.09%	10.00%	10.02%
		% of GOA	8.07%	9.54%	9.29%
	SP23		193	9,801	9,994
		% of Class	1.93%	98.07%	100.00%
		% of Sector	1.54%	13.20%	11.52%
		% of GOA	1.24%	12.59%	10.69%
	SP4		3,094	1,985	5,079
		% of Class	60.92%	39.08%	100.00%
		% of Sector	24.77%	2.67%	5.86%
		% of GOA	19.82%	2.55%	5.44%
	SP5		7,814	54,795	62,609
		% of Class	12.48%	87.52%	100.00%
		% of Sector	62.57%	73.82%	72.20%
		% of GOA	50.06%	70.39%	67.00%
	SP6		128	224	352
		% of Class	36.39%	63.61%	100.00%
		% of Sector	1.03%	0.30%	0.41%
		% of GOA	0.82%	0.29%	0.38%
Inshore Sector Total			12,489	74,229	86,719
		% of Sector	14.40%	85.60%	100.00%
		% of GOA	80.00%	95.36%	92.80%
Offshore	ICP		932	203	1,135
		% of Class	82.12%	17.88%	100.00%
		% of Sector	29.84%	5.62%	16.85%
		% of GOA	5.97%	0.26%	1.21%
	LP1		4	-	4
		% of Class	100.00%	0.00%	100.00%
		% of Sector	0.14%	0.00%	0.07%
		% of GOA	0.03%	0.00%	0.00%
	MP12		380	1,632	2,012
		% of Class	18.91%	81.09%	100.00%
		% of Sector	12.19%	45.18%	29.88%
		% of GOA	2.44%	2.10%	2.15%
	TP1		302	1,547	1,850
		% of Class	16.35%	83.65%	100.00%
		% of Sector	9.69%	42.85%	27.47%
		% of GOA	1.94%	1.99%	1.98%
	TP2		355	108	463
		% of Class	76.62%	23.38%	100.00%
		% of Sector	11.36%	3.00%	6.88%
		% of GOA	2.27%	0.14%	0.50%
	TP3		1,148	121	1,269
		% of Class	90.44%	9.56%	100.00%
		% of Sector	36.77%	3.36%	18.85%
		% of GOA	7.35%	0.16%	1.36%
Offshore Sector Total			3,122	3,611	6,733
		% of Sector	46.37%	53.63%	100.00%
		% of GOA	20.00%	4.64%	7.21%
GOA Total			15,611	77,840	93,452
		% of GOA	16.71%	83.29%	100.00%

Table 4.15c

Gulf of Alaska Pollock Discards, Retained, and Total Catch by Processor Class in 1993					
Sector	Class		Total Discard	Total Retained	Total Catch
Inshore	ICP		444	-	444
		% of Class	100.00%	0.00%	100.00%
		% of Sector	5.67%	0.00%	0.41%
		% of GOA	5.38%	0.00%	0.41%
	MP12		574	15,429	16,003
		% of Class	3.58%	96.41%	100.00%
		% of Sector	7.32%	15.41%	14.82%
		% of GOA	6.94%	15.38%	14.74%
	SP23		128	2,247	2,375
		% of Class	5.40%	94.60%	100.00%
		% of Sector	1.64%	2.24%	2.20%
		% of GOA	1.55%	2.24%	2.19%
	SP4		877	10,552	11,428
		% of Class	7.67%	92.33%	100.00%
		% of Sector	11.18%	10.54%	10.59%
		% of GOA	10.61%	10.52%	10.52%
	SP5		5,749	71,539	77,288
		% of Class	7.44%	92.56%	100.00%
		% of Sector	73.36%	71.46%	71.60%
		% of GOA	69.58%	71.30%	71.17%
	SP6		66	349	415
		% of Class	15.98%	84.02%	100.00%
		% of Sector	0.85%	0.35%	0.38%
		% of GOA	0.80%	0.35%	0.38%
Inshore Sector Total			7,837	100,116	107,951
		% of Sector	7.26%	92.74%	100.00%
		% of GOA	94.85%	99.79%	99.41%
Offshore Sector			425	214	639
		% of Sector	66.46%	33.54%	100.00%
		% of GOA	5.14%	0.21%	0.59%
GOA Total			8,262	100,330	108,590
		% of GOA	7.61%	92.39%	100.00%

Table 4.15d

Gulf of Alaska Pollock Discards, Retained, and Total Catch by Processor Class in 1994					
Sector	Class		Total Discard	Total Retained	Total Catch
Inshore	ICP		617	-	617
		% of Class	100.00%	0.00%	100.00%
		% of Sector	11.24%	0.00%	0.56%
		% of GOA	9.69%	0.00%	0.56%
	MP12		12	3,911	3,923
		% of Class	0.29%	99.71%	100.00%
		% of Sector	0.21%	3.76%	3.59%
		% of GOA	0.18%	3.74%	3.54%
	SP23		134	8,103	8,237
		% of Class	1.62%	98.38%	100.00%
		% of Sector	2.44%	7.80%	7.53%
		% of GOA	2.10%	7.76%	7.43%
	SP45		4,495	90,609	95,104
		% of Class	4.73%	95.27%	100.00%
		% of Sector	81.93%	87.19%	86.92%
		% of GOA	70.64%	86.74%	85.82%
	SP6		230	1,301	1,530
		% of Class	15.01%	84.99%	100.00%
		% of Sector	4.19%	1.25%	1.40%
		% of GOA	3.61%	1.25%	1.38%
Inshore Sector Total			5,486	103,925	109,411
		% of Sector	5.01%	94.99%	100.00%
		% of GOA	86.22%	99.49%	98.73%
Offshore Sector Total			877	533	1,410
		% of Sector	62.20%	37.80%	100.00%
		% of GOA	13.78%	0.51%	1.27%
GOA Total			6,363	104,458	110,821
		% of GOA	5.74%	94.26%	100.00%

Product Forms and Product Mix

Table 4.16 below describes processed product for each sector for 1991, 1992, and 1994 (1993 data for product forms are currently unavailable). In 1991 and 1992, the inshore sector focused primarily on fillets and surimi (34.99 % and 35.70 % respectively for 1991), with an increase in surimi production in 1992 (up to 40.35% of production) and a decrease in mince and meal/oil. An increase in roe production was also exhibited in 1992, up from .57% to 1.48%. Head and gut production for the inshore sector also rose in 1992 from .07% to 3.5%. By 1994, surimi productions appears steady at about 40% (39.07%), with fillet and roe production up substantially to 44.71% and 4.7% respectively.

The offshore sector in 1991 and 1992 placed little emphasis on fillet production (only 14.85% of their production in 1991 and 5.23% in 1992). Their emphasis in those years was on surimi (45.8% in 1991 and 64.08% in 1992) and H&G (10.19% in 1991 and 15.46% in 1992). These changes for each sector may hold implications for determining, in hindsight, the actual impacts of the allocations implemented under Amendment 18/23.

Table 4.16

Processed Product of GOA Pollock in 1991 by Sector								
Sector		H & G	Roe	Fillets	Surimi	Minced	Meal/Oil	Total Product
Inshore	Tons	11	100	6,097	6,221	1,584	1,922	17,422
	% of Sector Product	0.07%	0.57%	34.99%	35.70%	9.09%	11.03%	100.00%
	% of GOA Total	2.90%	32.83%	91.64%	78.38%	97.96%	40.96%	82.30%
Offshore	Tons	382	204	556	1,716	33	573	3,746
	% of Sector Product	10.19%	5.44%	14.85%	45.80%	0.88%	15.28%	100.00%
	% of GOA Total	97.10%	67.17%	8.36%	21.62%	2.04%	12.20%	17.70%
GOA Total	Tons	393	303	6,653	7,936	1,617	4,691	21,168
	% of GOA Total	1.86%	1.43%	31.43%	37.49%	7.64%	22.16%	100.00%

Processed Product of GOA Pollock in 1992 by Sector								
Sector		H & G	Roe	Fillets	Surimi	Minced	Meal/Oil	Total Product
Inshore	Tons	634	268	6,487	7,312	996	1,023	18,124
	% of Sector Product	3.50%	1.48%	35.79%	40.35%	5.50%	5.64%	100.00%
	% of GOA Total	81.81%	96.19%	99.27%	92.60%	100.00%	5.37%	95.21%
Offshore	Tons	141	11	48	584	0	123	912
	% of Sector Product	15.46%	1.17%	5.23%	64.08%	0.00%	13.44%	100.00%
	% of GOA Total	18.19%	3.81%	0.73%	7.40%	0.00%	0.64%	4.79%
GOA Total	Tons	775	279	6,535	7,896	996	2,235	19,035
	% of GOA Total	4.07%	1.47%	34.33%	41.48%	5.23%	11.74%	100.00%

Processed Product of GOA Pollock in 1994 by Sector								
Sector		H & G	Roe	Fillets	Surimi	Minced	Meal/Oil	Total Product
Inshore	Tons	56	1,083	10,302	9,003	1,281	1,136	23,042
	% of Sector Product	0.24%	4.70%	44.71%	39.07%	5.56%	4.93%	100.00%
	% of GOA Total	0.24%	4.70%	44.71%	39.07%	5.56%	4.93%	100.00%

Table 4.17 below is provided in order to shed light on the overall utilization patterns for each sector, which will factor into projections of total revenues, and revenue per mt, generated by the pollock harvest/processing. Total product utilization by the inshore sector appears stable from 1991 through 1994, at 22.58%, 20.90%, and 21.06% for the three years shown. This is calculated as total mt of product as a percentage of total catch.

The offshore sector information appears only for 1991 and 1992 since they were not allowed to fish in the GOA for pollock after that time (and only for part of 1992). In 1991, the overall utilization rate 16.06% per mt of catch, and that fell to 13.54% in 1992. This 13.54% should be viewed with caution since it is likely that the percentage would have been higher in 1992 if this sector had not been required to discard pollock by regulations implementing the inshore/offshore allocations. The 16.06 % is the best available data for overall offshore utilization rates in the GOA pollock fisheries.

Table 4.17

Production and Total Catch of Pollock in the GOA in 1991			
		Total Product	Total Catch
Inshore	Tons	17,422	77,162
	Product/Totals (PRR)	22.58%	
Offshore	Tons	3,746	23,325
	Product/Totals (PRR)	16.06%	
Total	Tons	21,168	100,487
	% of GOA Total	21.07%	

Production and Total Catch of Pollock in the GOA in 1992			
		Total Product	Total Catch
Inshore	Tons	18,124	86,719
	Product/Totals (PRR)	20.90%	
Offshore	Tons	912	6,733
	Product/Totals (PRR)	13.54%	
Total	Tons	19,035	93,452
	% of GOA Total	20.37%	

Production and Total Catch of Pollock in the GOA in 1994			
		Total Product	Total Catch
Inshore	Tons	23,042	109,411
	Product/Totals (PRR)	21.06%	

Table 4.18 below summarizes price information currently available (1990-1993) for various product forms, including the three primary pollock product forms—roe, surimi, and fillets. These prices, and differential changes over time for each product for each sector, were discussed in more detail in Section 4.2. They are reiterated here because these values will feed into the next tables which provide total revenue projections for each product, and revenue per mt values for overall pollock processed. The relative product mix of these products, combined with the prices (and price differentials) for each, will impact the overall revenues which were generated. This in turn will be compared to projections originally made in earlier analyses. Essentially, prices for both fillets and surimi have dropped dramatically since 1991 and 1992 when they were at all time highs. It is these higher prices which were utilized in earlier analyses. The differential changes in these prices shows that drop in price for surimi was relatively more than the drop in price for fillets, from the earlier time periods to 1994. Roe prices for each sector rose from 1991 to 1992, then have dropped back down somewhat by 1994.

Table 4.18

Product Prices For Pollock 1991-1993								
Year	Sector	Units	H & G	Roe	Fillets	Surimi	Minced	Meal/Oil
1991	Inshore	$/lb.	$ 0.263	$ 3.748	$ 1.336	$ 1.266	$ 0.701	$ 0.218
		$/mt.	$ 580.19	$ 8,262.84	$ 2,945.10	$ 2,791.02	$ 1,545.42	$ 481.39
	Offshore	$/lb.	$ 0.367	$ 4.649	$ 1.361	$ 1.576	$ 0.710	$ 0.250
		$/mt.	$ 809.15	$ 10,249.19	$ 3,001.15	$ 3,474.45	$ 1,565.27	$ 551.15
1992	Inshore	$/lb.	$ 0.499	$ 4.281	$ 1.209	$ 1.435	$ 0.383	$ 0.205
		$/mt.	$1,100.30	$ 9,437.89	$ 2,664.91	$ 3,163.60	$ 844.36	$ 452.32
	Offshore	$/lb.	$ 0.284	$ 5.509	$ 1.217	$ 1.581	$ 0.521	$ 0.245
		$/mt.	$ 625.83	$ 12,145.14	$ 2,682.77	$ 3,485.47	$ 1,148.60	$ 540.13
1993	Inshore	$/lb.	$ 0.344	$ 3.607	$ 1.035	$ 0.718	$ 0.393	$ 0.195
		$/mt.	$ 757.84	$ 7,951.99	$ 2,281.92	$ 1,582.90	$ 866.41	$ 429.21
	Offshore	$/lb.	$ 0.128	$ 5.119	$ 1.130	$ 0.798	$ 0.391	$ 0.223
		$/mt.	$ 283.09	$ 11,285.35	$ 2,491.39	$ 1,759.27	$ 862.00	$ 491.63

Table 4.19 below assimilates much of the information presented in the previous tables (4.14-4.18) to arrive at gross revenue projections and relative contribution of each product form to the overall gross revenues (for these three primary products only). Price per pound, for each of the three major product forms for each year, is converted to price per mt and then applied to the landings from the previous tables to arrive at gross revenues attributable to each product form. In 1991, total revenues for the inshore sector were about $39.5 million, of which 43.93% was accounted for by surimi. Only 2.08% was accounted for by roe, with the remaining 45.43% accounted for by fillets. This changed in 1992 primarily due to higher surimi prices relative to fillets and an increase in relative roe production, such that 51.46% of gross revenues were from surimi, 38.45% from fillets, and 5.63% from roe.

Looking at 1994 gross revenues, a dramatic change is evident in the relative contributions of each product form to overall gross revenues. Part of this redistribution is due to changes in the product mix emphasis while part of the change is due to relative price changes in the three primary product forms. Increased roe production relative to other product forms, combined with high roe price (though lower than 1992) and better overall recovery rates, results in roe production comprising 17.94% of overall gross revenues for the GOA inshore sector in 1994. Fillets have surpassed surimi to now account for 48.96%, with surimi accounting for the remaining 29.68%. The information for the offshore sector is provided only for 1991 and 1992 (they did not fish in 1993 or 1994 in the GOA) and is only provided for informational, as opposed to comparative purposes.

The information basically shows that, despite much lower prices for surimi and fillets, the inshore sector has maintained relative gross revenues since 1991 and 1992 by adjusting the product mixes to take advantage of price differentials, particularly for roe, and by increasing their overall product recovery rates. Table 4.20 takes the gross revenue information from Table 4.19 and applies it to catch for each year to arrive at an average revenue per mt of product, again only for the three primary product forms being examined.

Table 4.19

Gross Revenue of GOA Pollock in 1991 by Sector								
Sector		H & G	Roe	Fillets	Surimi	Minced	Meal/Oil	Total Gr. Revenue
Inshore	Tons	$ 6,614	$ 823,227	$ 17,955,614	$ 17,361,786	$ 2,447,999	$ 925,027	$ 39,520,267
	% of Sector Total Product	0.02%	2.08%	45.43%	43.93%	6.19%	2.34%	100.00%
	% of GOA Total	2.10%	28.27%	91.49%	74.44%	97.93%	19718.25%	79.17%
Offshore	Tons	$ 308,893	$ 2,089,194	$ 1,670,018	$ 5,961,113	$ 51,669	$ 315,561	$ 10,396,449
	% of Sector Total Product	2.97%	20.10%	16.06%	57.34%	0.50%	3.04%	100.00%
	% of GOA Total	97.90%	71.73%	8.51%	25.56%	2.07%	6726.63%	20.83%
GOA Total	Tons	315,508	2,912,421	19,625,632	23,322,899	2,499,668	4,691	49,916,716
	% of GOA Total	0.63%	5.83%	39.32%	46.72%	5.01%	0.01%	100.00%

Gross Revenue of GOA Pollock in 1992 by Sector								
Sector		H & G	Roe	Fillets	Surimi	Minced	Meal/Oil	Total Gr. Revenue
Inshore	Tons	$ 697,742	$ 2,533,036	$ 17,286,946	$ 23,133,136	$ 840,917	$ 462,539	$ 44,954,317
	% of Sector Total Product	1.55%	5.63%	38.45%	51.46%	1.87%	1.03%	100.00%
	% of GOA Total	88.77%	95.15%	99.27%	91.91%	99.99%	0.98%	94.84%
Offshore	Tons	$ 88,230	$ 129,103	$ 127,834	$ 2,036,213	$ 46	$ 66,193	$ 2,447,618
	% of Sector Total Product	3.60%	5.27%	5.22%	83.19%	0.00%	2.70%	100.00%
	% of GOA Total	11.23%	4.85%	0.73%	8.09%	0.01%	0.14%	5.16%
GOA Total	Tons	785,972	2,662,139	17,414,780	25,169,349	840,963	2,235	47,401,935
	% of GOA Total	1.66%	5.62%	36.74%	53.10%	1.77%	0.00%	100.00%

Gross Revenue of GOA Pollock in 1994 by Sector								
Sector		H & G	Roe	Fillets	Surimi	Minced	Meal/Oil	Total Gr. Revenue
Inshore	Tons	$ 42,204	$ 8,615,188	$ 23,508,562	$ 14,250,621	$ 1,109,643	$ 487,539	$ 48,013,757
	% of Sector Total Product	0.09%	17.94%	48.96%	29.68%	2.31%	1.02%	100.00%
	% of GOA Total	0.09%	17.94%	48.96%	29.68%	2.31%	1.02%	100.00%

Table 4.20

1991 GOA Gross Revenue per Ton of Catch by Sector		Gross Revenue	Total Catch
Inshore		$ 39,520,267	77,162
	Gross Revenue/Total Tons	$ 512.17	
Offshore		$ 10,396,449	23,325
	Gross Revenue/Total Tons	$ 445.72	
Total		$ 49,916,716	100,487
	Gross Revenue/Total Tons	$ 496.75	

1992 GOA Gross Revenue per Ton of Catch by Sector		Gross Revenue	Total Catch
Inshore		$ 44,954,317	86,719
	Gross Revenue/Total Tons	$ 518.39	
Offshore		$ 2,447,618	6,733
	Gross Revenue/Total Tons	$ 363.51	
Total		$ 47,401,935	93,452
	Gross Revenue/Total Tons	$ 507.23	

1994 GOA Gross Revenue per Ton of Catch by Sector		Gross Revenue	Total Catch
Inshore		$ 48,013,757	109,411
	Gross Revenue/Total Tons	$ 438.84	

In 1991, revenue per mt was $512 for the inshore sector compared to $445 for the offshore sector in the GOA, indicating more efficient product utilization overall. Comparative information beyond 1991 is irrelevant across these two sectors. In 1992, the inshore revenue per mt was relatively unchanged from 1991 at $518 per mt. The decreased revenue per mt for the offshore sector (down to $363) was likely due at least partially to forced discarding under the rules of the allocations in effect.

In 1994, revenue per mt decreased to $439 per mt for the inshore sector, due to significant reductions in prices for both surimi and fillets. The revenue per mt did not drop nearly as much the proportional drop in surimi and fillet prices, primarily due to high roe prices combined with a dramatic increase in overall roe production relative to surimi and fillets. The result is that roe, as noted previously, comprised about 18% of overall gross revenues for the inshore sector in 1994. This allowed the revenue per mt to be maintained at nearly the levels seen in 1991 and 1992. Again, 1993 information on product forms was unavailable so it is not included in this discussion.

Whether the utilization patterns, such as increased emphasis on roe and overall product recoveries, are a direct result of the inshore/offshore allocation of pollock is uncertain. It is likely, however, that it contributed at least partially to processor's abilities to make the production shifts which have allowed the overall revenues/mt to be maintained at relatively stable levels, despite significant reductions in price for two of the primary products. For GOA pollock at least, the relatively lower revenue per mt exhibited by the offshore sector in 1991 may indicate that total revenues generated from the GOA pollock fisheries would have been lower without the implementation of Amendment 23. Community impacts are discussed separately in Chapter 8.

4.6 BERING SEA AND ALEUTIAN ISLANDS POLLOCK

This section examines the BSAI pollock fishery during the years 1991-1994. The section is divided into four primary parts: (1) Catch and Discards; (2) Products and Product Mix; (3) Revenues; and (4) A comparison to the findings in the 1992 Supplemental Analysis.

4.6.1 Catch and Discards in the BSAI Pollock Fishery: 1991-1994

The BSAI pollock fishery has been harvested in two separate seasons (A and B) since 1991. During the 'A' season, valuable roe bearing pollock are plentiful. Generally, the quality and value of the roe increases as the season progresses until it reaches a peak in value usually sometime in March. In 1992, trawling in both the BSAI and the GOA was delayed until January 20 by a plan amendment, partially in an effort to take advantage of better roe quality later in the season. The 'B' season originally began in June, but in 1993 the start of the 'B' season was delayed by plan amendment to begin on August 15. This amendment was enacted to take advantage of lower bycatch rates in the fall. Figure 4.4 shows the progression of the fishery by week for each year, and is similar to Figures 4.2 and 4.3. The impacts of the delay of the trawl opening in 1992 and the delay of the 'B' season in 1993 are clearly seen. Impacts of the Inshore-Offshore Amendment however, are less readily seen. Figure 4.5a-d break out the progression of harvests by the inshore and offshore sectors, as well as the catches going to CDQs[1], for the years 1991-1994.

Figure 4.5a shows the simulaneous closing of both sectors in 1991. This is especially apparent for the B season. It is less apparent for the A season, because the offshore vessels entered heavily into the Aleutian Islands after the Bering Sea quota was taken. Figure 4.5b show the progression of the 1992 BSAI pollock fishery. The 1992 B season was the first fishery under the Inshore-Offshore Amendment. Figure 4.5b also shows the impact of the 1989 year class which recruited into the fishery during the B season of 1992. These small three-year old fish dominated B season fishery. The offshore sector fished continuously from the opening in June until their quota was taken at the end of July. The inshore sector started in early June, but upon finding the small fish voluntarily quit fishing until mid-July. The inshore B season then continued unabated until the end of September. While the inshore B season officially lasted 113 days, this graphic show the lengthy period of inactivity. The figure also shows the first CDQ fishery which took place in the last days of 1992.

Figure 4.5c shows the progression of the 1993 BSAI pollock fishery by sector. While the offshore sector jumps immediately to near peak levels, the inshore sector delays heavy prosecution of the fishery for several weeks.[2] This figure also shows the first A season CDQ fishery, which was prosecuted immediately following the Bering Sea offshore closure. A small portion of the B season CDQ fishery was prosecuted prior to the beginning of the regular B season and then continued following the offshore closure.

The 1994 CDQ B season fishery, as shown in Figure 4.5d, was prosecuted primarily before the beginning of the regular B season. We can only speculate why this shift in timing has occurred. This may be evidence that CDQ participants are finding better prices prior to the startup of the regular fishery, or possibly that they see a competitive advantage in being out on the water before other vessels. This would allow vessels to locate better fishing grounds and to "iron out" the operations of the vessel prior to the open access startup.

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[1]CDQ harvests in 1992 were not explicitly identified in 1992 data and therefore all pollock harvests and production in December 1992are assumed to be part of the CDQ program.

[2]A price dispute between delivery vessels and shoreside processors resulted in a strike by catcher vessels.

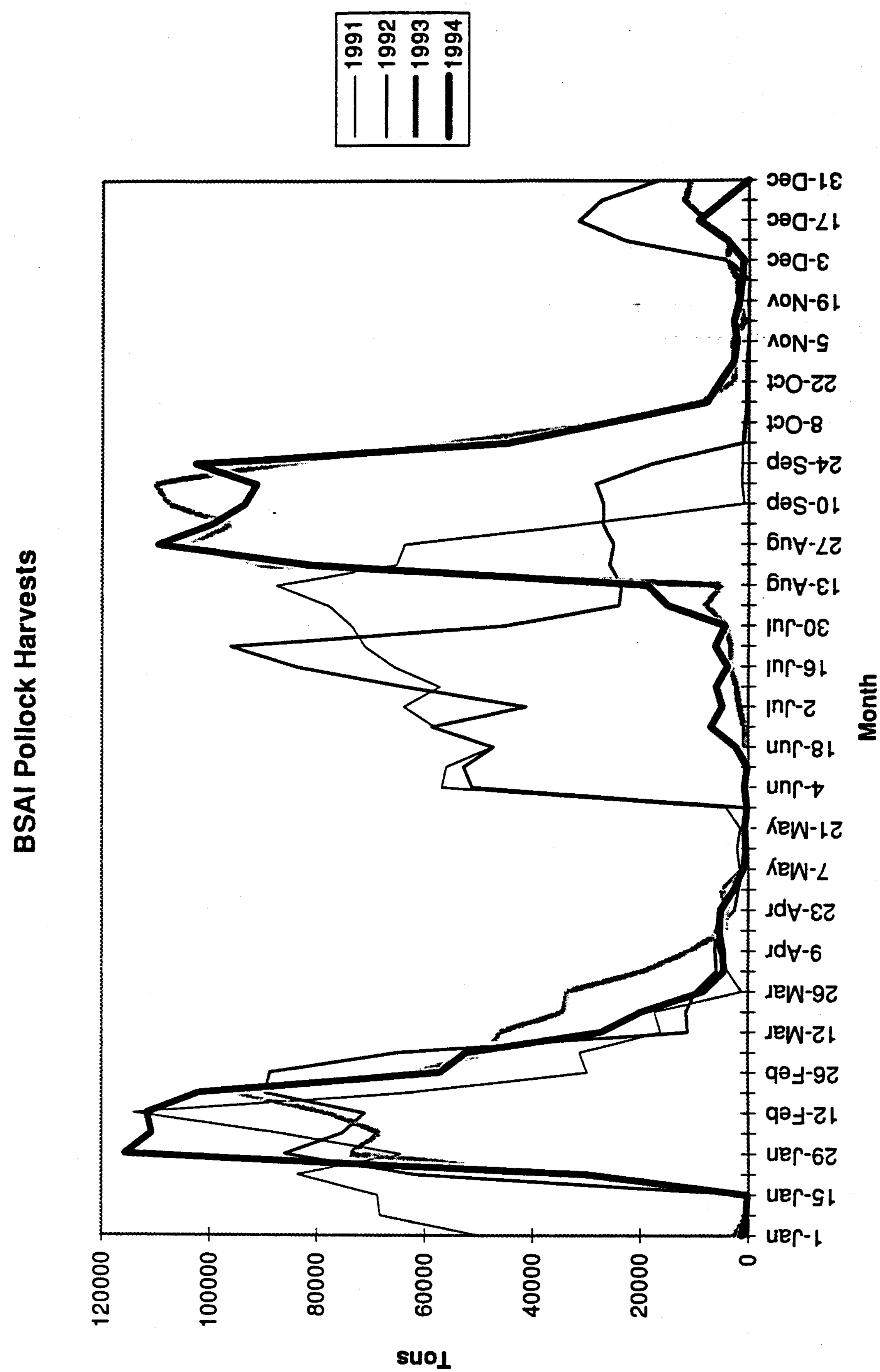

BSAI Pollock Harvests
Tons
Month
120000
100000
80000
60000
40000
20000
0
1-Jan
15-Jan
29-Jan
12-Feb
26-Feb
12-Mar
26-Mar
9-Apr
23-Apr
7-May
21-May
4-Jun
18-Jun
2-Jul
16-Jul
30-Jul
13-Aug
27-Aug
10-Sep
24-Sep
8-Oct
22-Oct
5-Nov
19-Nov
3-Dec
17-Dec
31-Dec
1991
1992
1993
1994

Figure 4.4

Figure 4.5a

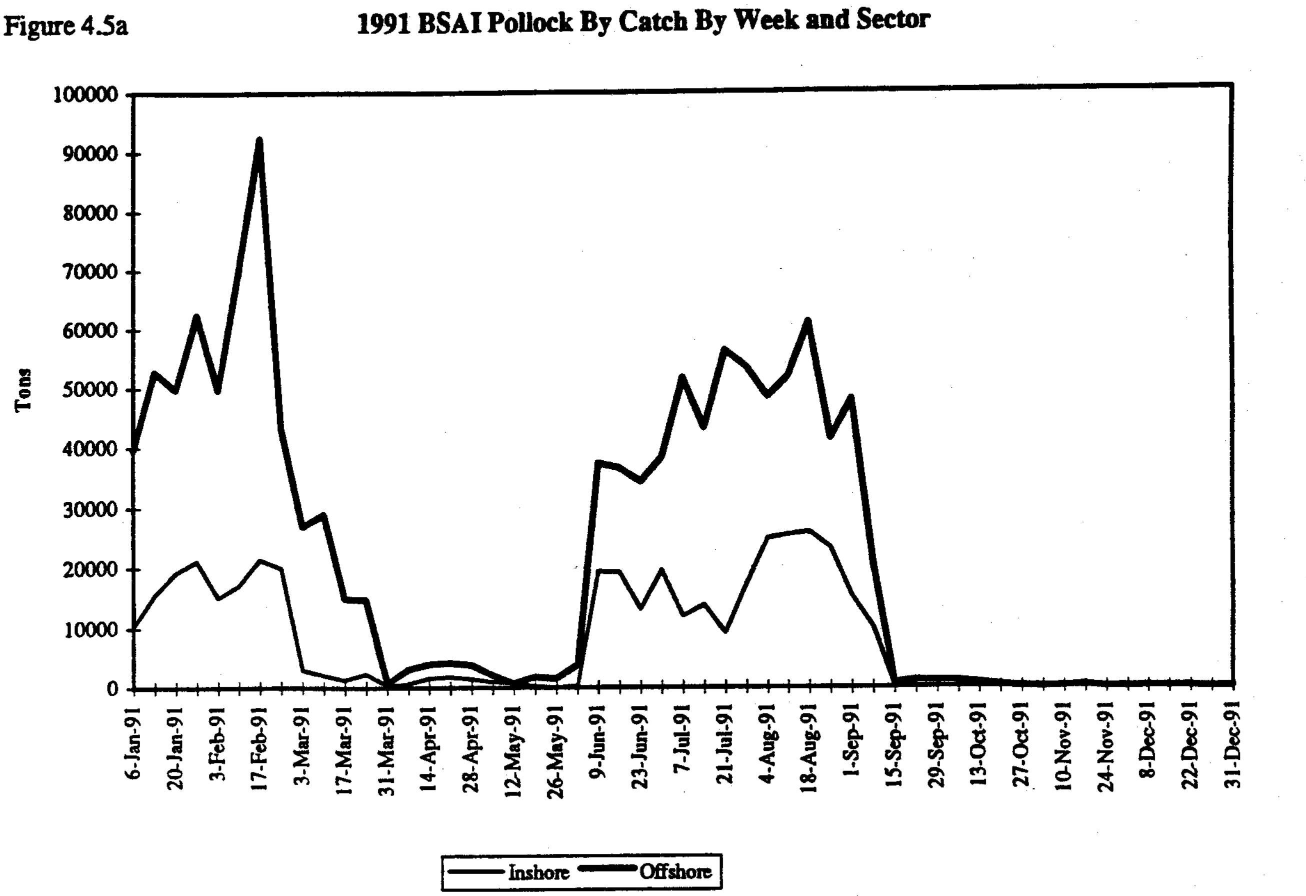


Figure 4.5b

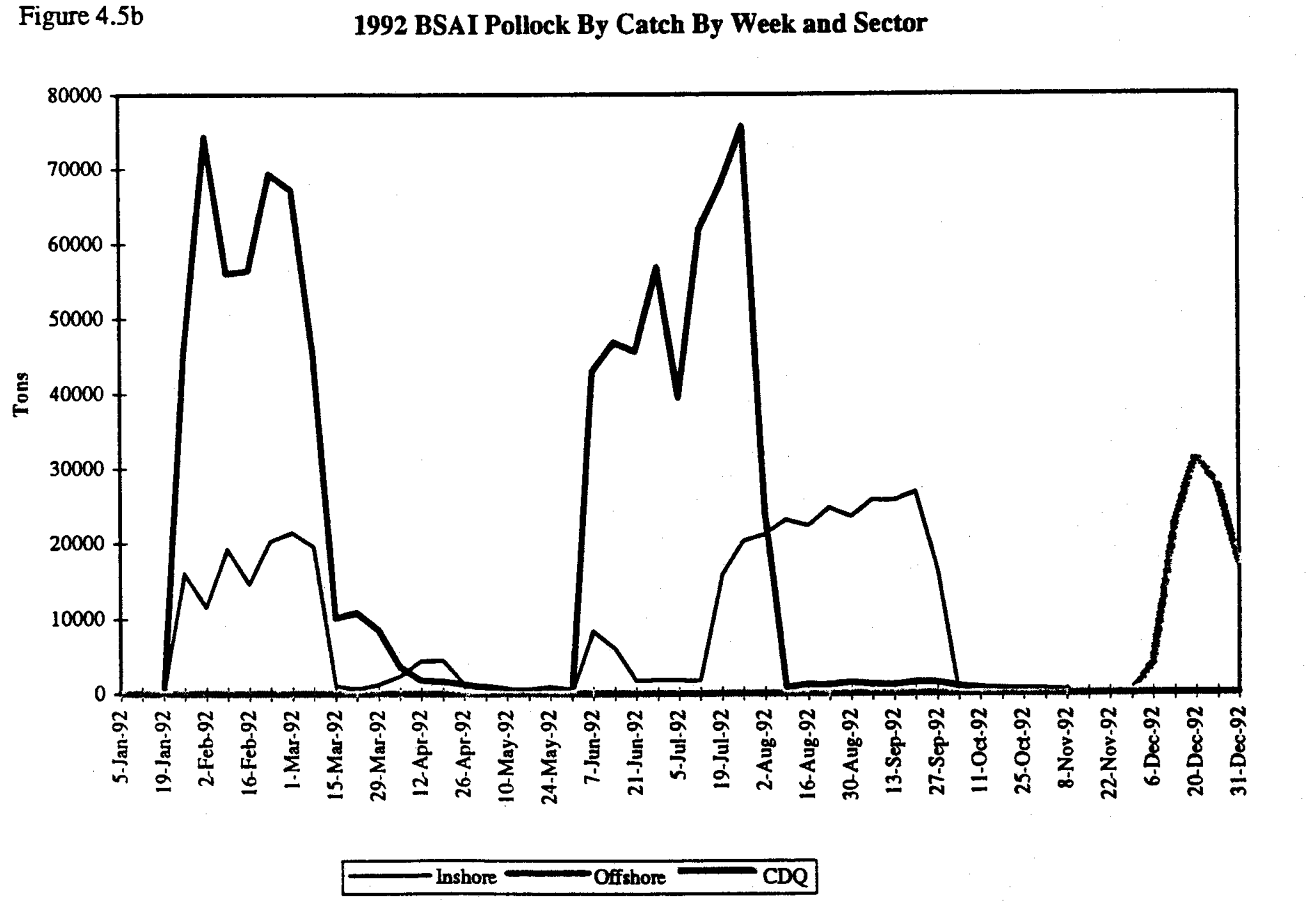


Figure 4.5c

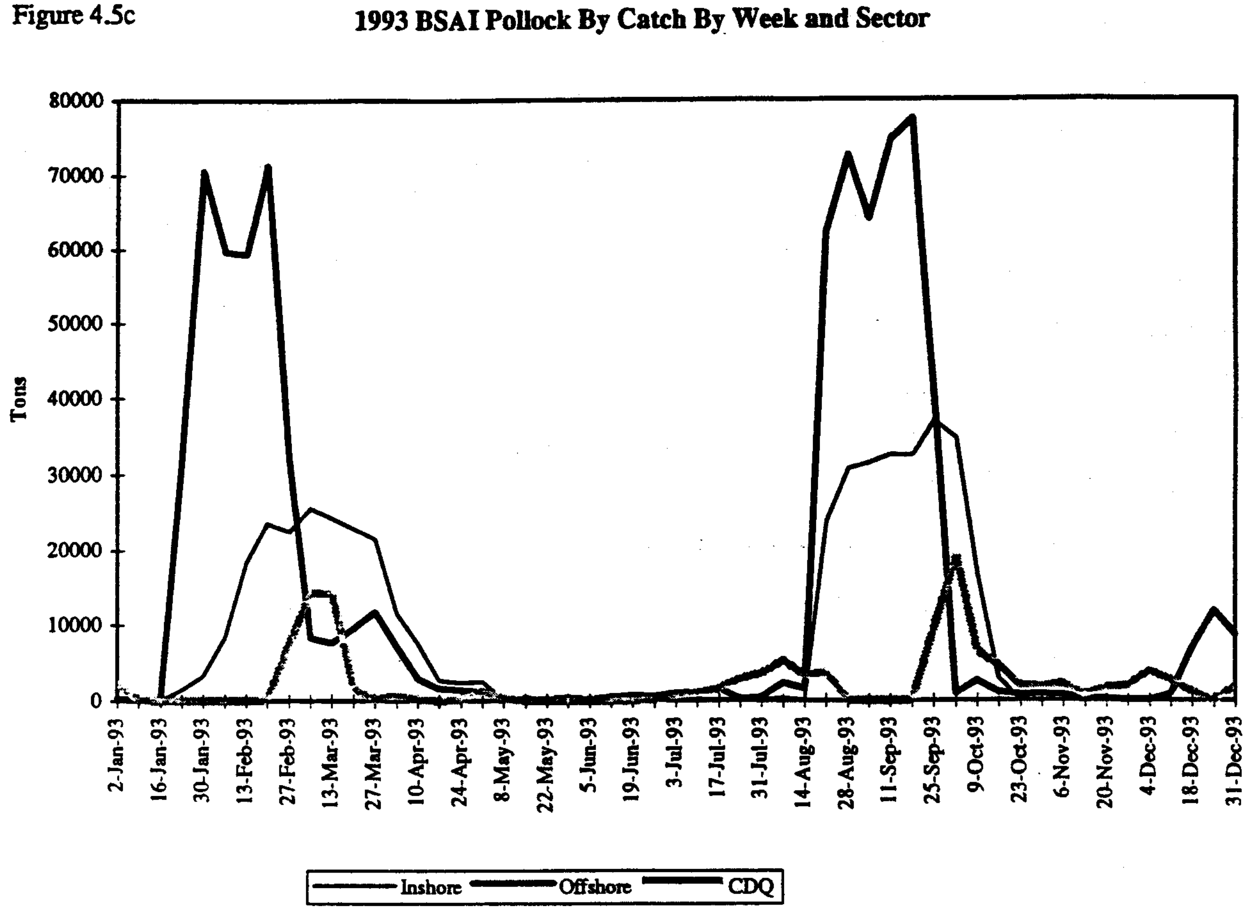
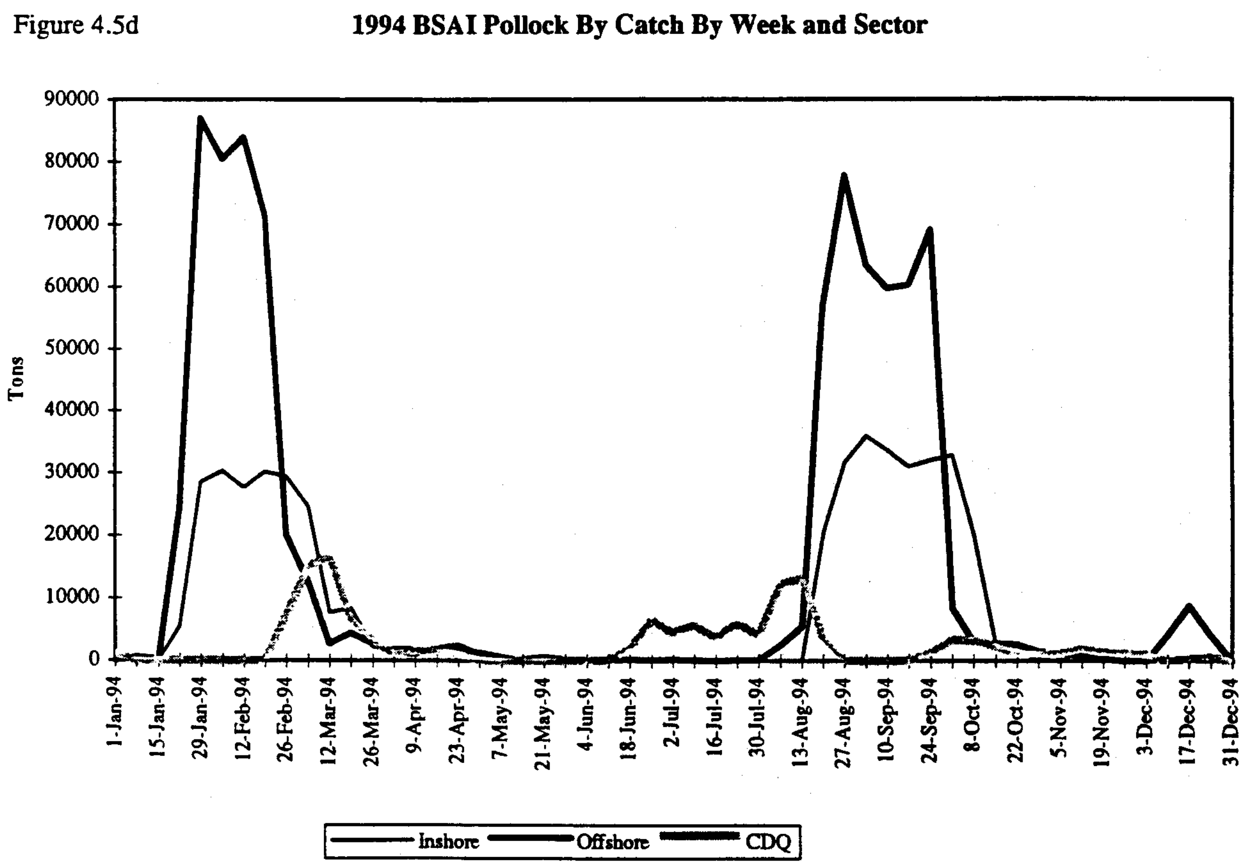


Figure 4.5d



Tables 4.21a-d detail the total catch, discards and retained catch by inshore and offshore sectors for the years 1991-1994. For the years 1993-1994, CDQ catches were excluded from the catch totals. In 1992, the identification by NMFS of CDQ catches, separate from inshore and offshore catches, had not yet been implemented. Therefore, all 1992 tables for both inshore and offshore sectors include catch and production from CDQ harvests. This should be remembered when examining 1992 results, but we do not expect this to impact the overall conclusions of the analysis. For each sector, we have included catches from the 'A' and 'B' seasons, catches when directed fishing for pollock was closed, and the yearly total. At the bottom of each chart, we have included A, B, and Closed Season totals for the entire BSAI. The final lines are the year's total from the BSAI.

The tables were constructed using blend data. Recall that blend data combines weekly reports submitted to NMFS and observer data. Blend data was first used officially in 1993 to monitor TAC attainment, but was constructed "after the fact" for the 1991 and 1992. This explains why catch totals for 1991 and 1992 appear much higher than the TACs. This is clearly evident in the estimated catch totals for the BSAI overall shown at the bottom of each of the tables. In 1991, the overall BSAI pollock catch was estimated using after the fact blend data at 1.6 million mt. In 1992, the total went to 1.4 million mt, and in 1993 the total is 1.25 million mt. This compares to TACs of 1,385,000 mt, 1,251,155 mt, and 1,251,155 mt in the same years. (The TACs in 1992 and 1993 reflect the 7.5% re-allocation to the pollock CDQ program.) It appears that the NMFS was able to shut down the pollock fisheries with more precision in 1993 than in earlier years. The difference however is doubtless accounted for by our use of blend data as opposed to weekly processor data for the years 1991 and 1992. In 1991 and 1992, and prior years as well, product recovery rate conversion from product total were used to estimate round weights, which was used to monitor attainment of the TACs. The variance of recovery rates and, in particular, the inability of weekly reports to account for discarded fish, led NMFS to switch to "blend data" which combines observer data and weekly product reports.

We have chosen to detail the catch by seasons for each sector because it allows some important findings to be demonstrated, particularly with regard to discards of pollock. In aggregating data for this table, we have used closure information from the NMFS bulletin board. NMFS may close a fishery on any day of the week, but because data is reported on a weekly basis, the numbers for season totals are somewhat inexact. According to NMFS, any catch of pollock which occurs after the close of the 'A' season for a given sector is counted against the 'B' season allocation for that sector. Theoretically it is possible, given directed fishing definitions which allow for the retention of pollock up to 20%, that a significant portion of the 'B' season allotment could be taken in the interim closed season. As is seen in the Tables 4.21a-d this has not happened, but this quirk in the accounting of catch totals manifests itself when examining data for the 'B' season for the two sectors.

Tables 4.21a-d are constructed with the "row percent/column percent" format used in earlier sections. As an example, Table 4.21a describes 1991. The first row of data is labeled "Inshore A Season" and shows that the inshore sector discarded 2,961 mt, retained 145,600 mt for a total 'A' season catch of 148,561 mt. The second row shows the "% of Sector A Season Total." This is the "row percent," i.e., the 2,961 mt of discards is 1.99% of the total 'A' season catch of 148,561 mt. Similarly 98% of the 'A' season inshore catch was retained according to the blend data. The third data row of the table is the "column percent." In this case, it shows the "% of the BSAI A season" of that category of catch. Thus, we see that the 2,961 mt discarded by the inshore sector in the 'A' season was 5.12% of the total amount of 'A' season discards. Similarly, we see that 21.42% of the BSAI 'A' season total catch was represented by the inshore sector's 148,561 mt.

In the section of Table 4.21a showing "Inshore Sector Total" we can see that 3.31% of the total inshore harvest was discarded, and 96.69% was retained. The third row in the sector total compares inshore discards to discards in the BSAI overall. The 13,484 mt of discarded pollock from the inshore sector was 9.59% of the total tonnage of pollock discards estimated in the BSAI. Moving to the right, we see that inshore retained catch was 26.8% of the BSAI total retained catch and overall that the inshore sector harvested 25.29% of the pollock in 1991.

Table 4.21a

BSAI Inshore and Offshore Pollock Catch By Season in 1991			
Sector	Discarded Catch	Retained Catch	Total Catch
Inshore A Season	2,961	145,600	148,561
% of Sector A Season Total	1.99%	98.01%	100.00%
% of BSAI A Season Total	5.12%	22.91%	21.42%
Inshore B Season	2,462	247,347	249,808
% of Sector B Season Total	0.99%	99.01%	100.00%
% of BSAI B Season Total	4.75%	29.88%	28.40%
Inshore Closed Season	8,061	860	8,921
% of Sector Closed Season Total	90.36%	9.64%	100.00%
% of BSAI Closed Season Total	26.10%	13.79%	24.03%
Inshore Sector Total	13,484	393,807	407,290
% of Sector Total	3.31%	96.69%	100.00%
% of BSAI Total	9.59%	26.80%	25.29%
Offshore A Season	54,911	490,041	544,952
% of Sector A Season Total	10.08%	89.92%	100.00%
% of BSAI A Season Total	94.88%	77.09%	78.58%
Offshore B Season	49,349	580,474	629,822
% of Sector B Season Total	7.84%	92.16%	100.00%
% of BSAI B Season Total	95.25%	70.12%	71.60%
Offshore Closed Season	22,829	5,377	28,206
% of Sector Closed Season Total	80.94%	19.06%	100.00%
% of BSAI Closed Season Total	73.90%	86.21%	75.97%
Offshore Sector Total	127,089	1,075,892	1,202,980
% of Sector Total	10.56%	89.44%	100.00%
% of BSAI Closed Season Total	90.41%	73.20%	74.71%
BSAI Total A Season	57,872	635,641	693,513
% of BSAI A Season Total	8.34%	91.66%	100.00%
% of BSAI Year Total	41.17%	43.25%	43.07%
BSAI Total B Season	51,811	827,821	879,630
% of BSAI B Season Total	5.89%	94.11%	100.00%
% of BSAI Year Total	36.86%	56.33%	54.63%
BSAI Total Closed Season	30,890	6,237	37,127
% of BSAI Closed Season Total	83.20%	16.80%	100.00%
% of BSAI Year Total	21.97%	0.42%	2.31%
BSAI Total	140,573	1,469,699	1,610,270
% of BSAI Total	8.73%	91.27%	100.00%

Table 4.21b

BSAI Inshore and Offshore Pollock Catch By Season in 1992			
Sector	Discarded Catch	Retained Catch	Total Catch
Inshore A Season	4,017	132,936	136,952
% of Sector A Season Total	2.93%	97.07%	100.00%
% of BSAI A Season Total	6.97%	25.08%	23.30%
Inshore B Season	6,703	260,290	266,993
% of Sector B Season Total	2.51%	97.49%	100.00%
% of BSAI B Season Total	12.77%	38.54%	36.68%
Inshore Closed Season	2,909	16,313	19,222
% of Sector Closed Season Total	15.13%	84.87%	100.00%
% of BSAI Closed Season Total	14.02%	15.97%	15.64%
Inshore Sector Total	13,629	409,539	423,167
% of Sector Total	3.22%	96.78%	100.00%
% of BSAI Total	10.42%	31.32%	29.42%
Offshore A Season	53,580	397,167	450,747
% of Sector A Season Total	11.89%	88.11%	100.00%
% of BSAI A Season Total	93.03%	74.92%	76.70%
Offshore B Season	45,786	415,051	460,837
% of Sector B Season Total	9.94%	90.06%	100.00%
% of BSAI B Season Total	87.23%	61.46%	63.32%
Offshore Closed Season	17,844	85,817	103,661
% of Sector Closed Season Total	17.21%	82.79%	100.00%
% of BSAI Closed Season Total	85.98%	84.03%	84.36%
Offshore Sector Total	117,210	898,035	1,015,245
% of Sector Total	11.54%	88.46%	100.00%
% of BSAI Closed Season Total	89.58%	68.68%	70.58%
BSAI Total A Season	57,597	530,103	587,699
% of BSAI A Season Total	9.80%	90.20%	100.00%
% of BSAI Year Total	44.02%	40.54%	40.86%
BSAI Total B Season	52,489	675,341	727,830
% of BSAI B Season Total	7.21%	92.79%	100.00%
% of BSAI Year Total	40.12%	51.65%	50.60%
BSAI Total Closed Season	20,753	102,130	122,883
% of BSAI Closed Season Total	16.89%	83.11%	100.00%
% of BSAI Year Total	15.86%	7.81%	8.54%
BSAI Total	130,839	1,307,574	1,438,412
% of BSAI Total	9.10%	90.90%	100.00%

Table 4.21c

BSAI Inshore and Offshore Pollock Catch By Season in 1993			
Sector	Discarded Catch	Retained Catch	Total Catch
Inshore A Season	15,799	174,093	189,891
% of Sector A Season Total	8.32%	91.68%	100.00%
% of BSAI A Season Total	27.80%	34.70%	34.00%
Inshore B Season	5,041	235,355	240,396
% of Sector B Season Total	2.10%	97.90%	100.00%
% of BSAI B Season Total	24.14%	37.93%	37.48%
Inshore Closed Season	9,254	3,047	12,301
% of Sector Closed Season Total	75.23%	24.77%	100.00%
% of BSAI Closed Season Total	29.35%	11.16%	20.91%
Inshore Sector Total	30,094	412,495	442,588
% of Sector Total	6.80%	93.20%	100.00%
% of BSAI Total	27.55%	35.89%	35.16%
Offshore A Season	41,023	327,565	368,588
% of Sector A Season Total	11.13%	88.87%	100.00%
% of BSAI A Season Total	72.20%	65.30%	66.00%
Offshore B Season	15,844	385,155	401,000
% of Sector B Season Total	3.95%	96.05%	100.00%
% of BSAI B Season Total	75.86%	62.07%	62.52%
Offshore Closed Season	22,279	24,253	46,532
% of Sector Closed Season Total	47.88%	52.12%	100.00%
% of BSAI Closed Season Total	70.65%	88.84%	79.09%
Offshore Sector Total	79,146	736,973	816,120
% of Sector Total	9.70%	90.30%	100.00%
% of BSAI Closed Season Total	72.45%	64.11%	64.84%
BSAI Total A Season	56,822	501,658	558,479
% of BSAI A Season Total	10.17%	89.83%	100.00%
% of BSAI Year Total	52.02%	43.64%	44.37%
BSAI Total B Season	20,885	620,510	641,396
% of BSAI B Season Total	3.26%	96.74%	100.00%
% of BSAI Year Total	19.12%	53.98%	50.96%
BSAI Total Closed Season	31,533	27,300	58,833
% of BSAI Closed Season Total	53.60%	46.40%	100.00%
% of BSAI Year Total	28.87%	2.38%	4.67%
BSAI Total	109,240	1,149,468	1,258,708
% of BSAI Total	8.68%	91.32%	100.00%

Table 4.21d

BSAI Inshore and Offshore Pollock Catch By Season in 1994			
Sector	Discarded Catch	Retained Catch	Total Catch
Inshore A Season	6,745	185,796	192,541
% of Sector A Season Total	3.50%	96.50%	100.00%
% of BSAI A Season Total	20.72%	34.43%	33.65%
Inshore B Season	1,840	236,215	238,056
% of Sector B Season Total	0.77%	99.23%	100.00%
% of BSAI B Season Total	6.11%	38.86%	37.32%
Inshore Closed Season	11,509	6,136	17,646
% of Sector Closed Season Total	65.22%	34.78%	100.00%
% of BSAI Closed Season Total	25.90%	22.39%	24.56%
Inshore Sector Total	20,095	428,147	448,243
% of Sector Total	4.48%	95.52%	100.00%
% of BSAI Total	18.76%	36.44%	34.96%
Offshore A Season	25,817	353,855	379,672
% of Sector A Season Total	6.80%	93.20%	100.00%
% of BSAI A Season Total	79.28%	65.57%	66.35%
Offshore B Season	28,303	371,588	399,891
% of Sector B Season Total	7.08%	92.92%	100.00%
% of BSAI B Season Total	93.89%	61.14%	62.68%
Offshore Closed Season	32,928	21,275	54,203
% of Sector Closed Season Total	60.75%	39.25%	100.00%
% of BSAI Closed Season Total	74.10%	77.61%	75.44%
Offshore Sector Total	87,048	746,718	833,766
% of Sector Total	10.44%	89.56%	100.00%
% of BSAI Closed Season Total	81.24%	63.56%	65.04%
BSAI Total A Season	32,562	539,651	572,213
% of BSAI A Season Total	5.69%	94.31%	100.00%
% of BSAI Year Total	30.39%	45.93%	44.63%
BSAI Total B Season	30,143	607,803	637,947
% of BSAI B Season Total	4.73%	95.27%	100.00%
% of BSAI Year Total	28.13%	51.73%	49.76%
BSAI Total Closed Season	44,437	27,411	71,849
% of BSAI Closed Season Total	61.85%	38.15%	100.00%
% of BSAI Year Total	41.47%	2.33%	5.60%
BSAI Total	107,143	1,174,865	1,282,009
% of BSAI Total	8.36%	91.64%	100.00%

It is also useful to examine differences by season within the inshore sector. Focusing on discards, we notice that, discards dropped considerably in the 1991 'B' season relative to the 'A' season, from 1.99% of the 'A' season total to 0.99% of the 'B' season catch. We also notice that the amount of pollock discards when pollock was closed to directed fishing is almost two-thirds of the inshore sector's total amount of discarded pollock. When these "regulatory discards" are not considered separately, there is a tendency to over-estimate the amount of discards of pollock in the directed pollock fisheries. For example, when we looked at the inshore sector totals in the previous paragraph, the activities during the closed season were included.

An examination of the offshore sector by season in 1991 reveals similar trends. Discards, although a greater percentage in each season, drop relative to retained catch in the 'B' season, and overwhelm retained catch when directed fishing for pollock is closed. Offshore discards during the closed season account for nearly 18% of the total offshore discards, but total catch in the closed season accounted for only 2.3% of the offshore total.

From Table 4.21a, we note that the offshore sector accounted for 78.58% of the BSAI 'A' season, 71.60% of the BSAI 'B' season total, and overall accounted for 74.71% of the total catch for the year. Compare this to Table 4.21b-d and we see that in 1992 the offshore sector accounts for 76.7 % of the 'A' season total, a decrease of 1.9% from the in the previous year. Recall that the Inshore-Offshore Amendment was not implemented in the BSAI until June of 1992. This may be an indication that the inshore sector's share was growing even without the Inshore-Offshore Amendment. The 'B' season total catches in Table 4.21b reflect the 65/35 split, with offshore's 'B' season total coming close at 63.3%. This table uses blend data which was created "after the fact" which explains the slight deviation from 65%. In 1993 and 1994, blend data was used to monitor the attainment of TACs and therefore in those years the harvest splits are much closer to the allocated amounts.

Overall in 1992, there were generally higher amounts of discards relative to retained catch particularly when only the 'A' and 'B' seasons are considered. The inshore sector seasonal discards increased relative to their total catch by 1% in the 'A' season and 1.5% in the 'B' season. Similarly, the offshore sectors proportion of pollock discards to total catch increased 1.8% and 2% compared to 'A' and 'B' seasons in the prior year. For both sectors, discards when directed fishing for pollock was closed, fell considerably. The net result was that for the year discards stayed at relatively the same level.

Table 4.21c shows a considerable increase in the proportion of discards in the inshore sector. 'A' season discards jumped from 3% to 8% of the sectors catch. In the 'B' season discards were slightly lower, but in the closed season, inshore discards increase relative to 1992. Overall discards in the inshore sector increased from an estimated 2.33% of the sector total to 6.8% of the sector total in 1993. Comparing inshore discards to overall BSAI discards the inshore sector's proportion increased from 10% of the BSAI total discards to 28% in 1993. At the same time, offshore discards actually dropped as a percent of their sector's total catch from 12% to 10% in 1993. Much of the decrease in offshore discards came in the 'B' season. Recall from the earlier discussion that the 'B' season in 1992 had reportedly a large number of small pollock which increased the amount of discards. The inshore sector was able to avoid much of the problem that year by voluntarily remaining on the beach. Regardless of the cause, discards in the 'B' season for the offshore sector dropped to 4% of their 'B' season total in 1993. Overall relative pollock discards in the BSAI dropped slightly from 1992.

The first full year of the allocations resulting from the Inshore-Offshore Amendment occurred in 1993. Thus, the inshore sectors proportion of the 'A' and 'B' season climbed to 34% and 37% respectively. As discussed earlier, the inshore sector's season length increased as well. Overall, the inshore sector accounted for 35.16% of the BSAI total catch, while the offshore sector accounted for the remaining 64.84%.

In 1994, as seen in Table 4.21d, inshore discards dropped in both the 'A' and 'B' seasons compared to 1993. Offshore discards in the 'A' season dropped in 1994 compared to 1993, but increased in the 'B' season and in the closed season. Overall offshore discards were slightly higher in 1993 compared to 1994. Overall discards of pollock in the BSAI dropped slightly as a percent of total catch in 1994.

4.6.2 Catch and Discards by Processing Classes Within Sectors

An examination of catch within each sector by processing class sheds some light on the dynamics of intrasector competition. Recall that the definition of "inshore" included motherships and catcher-processors, the ICP class. By adding these categories to the inshore sector the actual change in catch going to "shore-based" plants may not have been as great as anticipated. Tables 4.22a-d show the catch by processing classes within each sector.

These tables use the same "row percent/column percent" format used in earlier tables, with an additional row of "column" percents. As an example, in Table 4.22a the second set of rows details the discards, retained catch, and total catch delivered to the SP23 category. The SP23 category are those "shore based" processing plants located in Dutch Harbor/Unalaska, Akutan, the Pribilofs and the Aleutian Islands. The table shows that in 1991 this sector accounted for 6,669 mt of discards, and 362,397 mt of retained catch for a total of 369,066 mt. SP23 discards were 1.81% of their total catch. The third row shows the "column" percent within the inshore sector. Discards of SP23 were 49.46% of the total amount of inshore discards reported. This category also processed for 92.02% of the inshore sector's retained catch, and 90.61% of the total sector catch. The fourth row in the group is also a "column" percent which shows how much of the entire BSAI catch was accrued by this class. The SP23 category accounted for 4.74% of the total BSAI discards and 24.66% of the total retained.

Also included in the inshore sector for 1991 are those motherships which were designated as "inshore" once the Inshore-Offshore Amendment was implemented in June of 1992. In 1991, the MP12 category accrued 46% of the pollock discards within the inshore sector but only 7.57% of the retained catch. The pollock discards of MP12 category accounted for 17% of that categories 36,011 total harvest. Compare this to the discards accounted for by the SP45 category. These shore plants located in Gulf waters on the Alaskan Peninsula and in Kodiak discarded 27% of the pollock which was delivered. However, since the SP45 category accounted for only 0.54% of the BSAI inshore pollock harvest, there discards were rather insignificant.

Looking at the offshore sector in 1991, we notice the greater number of processing categories. For completeness, we have included all categories which participated in the pollock fishery, however, two categories, the longline processors (LP1) and pot processors (PCP), are very minor actors in the pollock fisheries never accounting for more than 0.18% of the overall BSAI harvest. In 1991, the ICP vessels were also relatively minor players. These vessels were categorized by NMFS in the offshore sector in 1992 and therefore show up as offshore in 1991 as well. Overall, the ICP fleet discarded more pollock (1,319 mt) than they retained (969 mt). Their 2,288 mt total was 0.23% of the offshore total harvest. Motherships in the offshore sector (MP12) were the second largest class in the offshore sector in 1991 accounting for 16% of the offshore total. The MP12 category discarded 6% of the pollock they received which was 8% of the offshore discard total.

The largest class, in terms of tonnage, is the TP1 class of surimi factory trawlers. In 1991, the TP1 category accounted for 43% of the offshore sector discards and 71% of the offshore retained total and over 48% of the entire BSAI. Like the MP12 category, the TP1 class discarded proportionately less pollock then most of the other offshore classes. The TP2 class (fillet factory trawlers) discarded 27% of their total harvest of pollock, while the TP3 class (H&G trawler processors) discarded 72% of the pollock they brought on board 14% of the offshore pollock discards. Because the TP3 category does not target heavily on pollock their 6,412 mt of retained catch was only 0.7% of the offshore sector total.

Table 4.22b shows the catch by class in 1992. The catch by the Inshore MP12 class shows a dramatic increase from 9% to 15% of the sector total for the year. Also increasing their involvement with BSAI pollock were Gulf shore plants. The SP4, SP5 and SP6 categories combined took 3.3% of total inshore harvest up from 0.5% in the previous year. At the same time the SP23 categories percent of the inshore total drops to 82%. Discards also shifted within the inshore sector. In 1992, the SP23 category accounted for over 60% of the inshore discards. As noted earlier, discards for sector as a percent of BSAI total discards stayed relatively the same.

Table 4.22a

Bering Sea and Aleutian Islands Pollock Discards, Retained, and Total Catch by Processor Class in 1991					
Sector	Class		Total Discard	Total Retained	Total Catch
Inshore	MP12		6,211	29,800	36,011
		% of Class	17.25%	82.75%	100.00%
		% of Sector	46.07%	7.57%	8.84%
		% of BSAI	4.42%	2.03%	2.24%
	SP23		6,669	362,397	369,066
		% of Class	1.81%	98.19%	100.00%
		% of Sector	49.46%	92.02%	90.61%
		% of BSAI	4.74%	24.66%	22.92%
	SP45		603	1,610	2,213
		% of Class	27.26%	72.73%	100.00%
		% of Sector	4.48%	0.41%	0.54%
		% of BSAI	0.43%	0.11%	0.14%
Inshore Sector Total			13,484	393,807	407,290
		% of Sector	3.31%	96.69%	100.00%
		% of BSAI	9.59%	26.80%	25.29%
Offshore	ICP		3,348	542	3,890
		% of Class	86.07%	13.92%	100.00%
		% of Sector	2.63%	0.05%	0.32%
		% of BSAI	2.38%	0.04%	0.24%
	LP1		2,022	128	2,150
		% of Class	94.06%	5.94%	100.00%
		% of Sector	1.59%	0.01%	0.18%
		% of BSAI	1.44%	0.01%	0.13%
	MP12		6,775	140,585	147,360
		% of Class	4.60%	95.40%	100.00%
		% of Sector	5.33%	13.07%	12.25%
		% of BSAI	4.82%	9.57%	9.15%
	PCP		88	0	88
		% of Class	99.96%	0.04%	100.00%
		% of Sector	0.07%	0.00%	0.01%
		% of BSAI	0.06%	0.00%	0.01%
	TP1		52,523	799,502	852,026
		% of Class	6.16%	93.84%	100.00%
		% of Sector	41.33%	74.31%	70.83%
		% of BSAI	37.36%	54.40%	52.91%
	TP2		35,989	122,069	158,058
		% of Class	22.77%	77.23%	100.00%
		% of Sector	28.32%	11.35%	13.14%
		% of BSAI	25.60%	8.31%	9.82%
	TP3		26,343	13,066	39,408
		% of Class	66.85%	33.16%	100.00%
		% of Sector	20.73%	1.21%	3.28%
		% of BSAI	18.74%	0.89%	2.45%
Offshore Sector Total			127,089	1,075,892	1,202,980
		% of Sector	10.56%	89.44%	100.00%
		% of BSAI	90.41%	73.20%	74.71%
BSAI Total			140,573	1,469,699	1,610,270
		% of BSAI	8.73%	100.00%	100.00%

Table 4.22b

Bering Sea and Aleutian Islands Pollock Discards, Retained, and Total Catch by Processor Class in 1992					
Sector	Class		Total Discard	Total Retained	Total Catch
Inshore	MP12		3,949	59,496	63,444
		% of Class	6.22%	93.78%	100.00%
		% of Sector	28.97%	14.53%	14.99%
		% of BSAI	3.02%	4.55%	4.41%
	SP23		8,281	337,089	345,370
		% of Class	2.40%	97.60%	100.00%
		% of Sector	60.76%	82.31%	81.62%
		% of BSAI	6.33%	25.78%	24.01%
	SP4		868	7,787	8,655
		% of Class	10.02%	89.98%	100.00%
		% of Sector	6.37%	1.90%	2.05%
		% of BSAI	0.66%	0.60%	0.60%
	SP5		360	4,891	5,251
		% of Class	6.86%	93.14%	100.00%
		% of Sector	2.64%	1.19%	1.24%
		% of BSAI	0.28%	0.37%	0.37%
	SP6		171	276	447
		% of Class	38.28%	61.72%	100.00%
		% of BSAI	0.13%	0.02%	0.03%
Inshore Sector Total			13,629	409,539	423,167
		% of Class	3.22%	96.78%	100.00%
		% of BSAI	10.42%	31.32%	29.42%
Offshore	ICP		1,319	969	2,288
		% of Class	57.65%	42.35%	100.00%
		% of Sector	1.13%	0.11%	0.23%
		% of BSAI	1.01%	0.07%	0.16%
	LP1		2,235	52	2,287
		% of Class	97.72%	2.28%	100.00%
		% of Sector	1.91%	0.01%	0.23%
		% of BSAI	1.71%	0.00%	0.16%
	MP12		9,550	150,610	160,159
		% of Class	5.96%	94.04%	100.00%
		% of Sector	8.15%	16.77%	15.78%
		% of BSAI	7.30%	11.52%	11.13%
	PCP		76	6	81
		% of Class	93.08%	6.92%	100.00%
		% of Sector	0.06%	0.00%	0.01%
		% of BSAI	0.06%	0.00%	0.01%
	TP1		50,882	640,639	691,521
		% of Class	7.36%	92.64%	100.00%
		% of Sector	43.41%	71.34%	68.11%
		% of BSAI	38.89%	48.99%	48.08%
	TP2		36,361	99,347	135,709
		% of Class	26.79%	73.21%	100.00%
		% of Sector	31.02%	11.06%	13.37%
		% of BSAI	27.79%	7.60%	9.43%
	TP3		16,788	6,412	23,200
		% of Class	72.36%	27.64%	100.00%
		% of Sector	14.32%	0.71%	2.29%
		% of BSAI	12.83%	0.49%	1.61%
Offshore Sector Total			117,210	898,035	1,015,245
		% of Class	11.55%	88.45%	100.00%
		% of BSAI	89.58%	68.68%	70.58%
BSAI Total			130,839	1,307,574	1,438,412
		% of BSAI	9.10%	90.90%	100.00%

Table 4.22c

Bering Sea and Aleutian Islands Pollock Discards, Retained, and Total Catch by Processor Class in 1993					
Sector	Class		Total Discard	Total Retained	Total Catch
Inshore	ICP		4,510	892	5,402
		% of Class	83.49%	16.51%	100.00%
		% of Sector	14.98%	0.22%	1.22%
		% of BSAI	4.13%	0.08%	0.43%
	MP12		7,196	69,267	76,462
		% of Class	9.41%	90.59%	100.00%
		% of Sector	23.91%	16.79%	17.28%
		% of BSAI	6.59%	6.03%	6.08%
	SP23		14,775	324,088	338,864
		% of Class	4.36%	95.64%	100.00%
		% of Sector	49.10%	78.57%	76.56%
		% of BSAI	13.53%	28.20%	26.96%
	SP4		3,350	16,815	20,166
		% of Class	16.61%	83.38%	100.00%
		% of Sector	11.13%	4.08%	4.56%
		% of BSAI	3.07%	1.46%	1.60%
	SP5		263	1,432	1,695
		% of Class	15.50%	84.49%	100.00%
		% of Sector	0.87%	0.35%	0.38%
		% of BSAI	0.24%	0.12%	0.13%
Inshore Sector Total			30,094	412,495	442,588
		% of Sector	6.80%	93.20%	100.00%
		% of BSAI	27.55%	35.89%	35.21%
Offshore	LP1		1,472	174	1,645
		% of Class	89.45%	10.55%	100.00%
		% of Sector	1.86%	0.02%	0.20%
		% of BSAI	1.35%	0.02%	0.13%
	MP12		1,082	114,381	115,463
		% of Class	0.94%	99.06%	100.00%
		% of Sector	1.37%	15.52%	14.18%
		% of BSAI	0.99%	9.95%	9.19%
	PCP		3	-	3
		% of Class	100.00%	0.00%	100.00%
		% of Sector	0.00%	0.00%	0.00%
		% of BSAI	0.00%	0.00%	0.00%
	TP1		22,141	529,904	552,045
		% of Class	4.01%	95.99%	100.00%
		% of Sector	27.98%	71.92%	67.78%
		% of BSAI	20.27%	46.11%	43.92%
	TP2		29,999	84,236	114,234
		% of Class	26.26%	73.74%	100.00%
		% of Sector	37.90%	11.43%	14.03%
		% of BSAI	27.46%	7.33%	9.09%
	TP3		24,450	8,280	32,730
		% of Class	74.70%	25.30%	100.00%
		% of Sector	30.89%	1.12%	4.02%
		% of BSAI	22.38%	0.72%	2.60%
Offshore Sector Total			79,146	736,802	814,474
		% of Sector	9.72%	100.00%	100.00%
		% of BSAI	72.45%	64.11%	64.79%
BSAI Total			109,240	1,149,296	1,257,062
		% of BSAI	8.69%	91.43%	100.00%

Table 4.22d

Bering Sea and Aleutian Islands Pollock Discards, Retained, and Total Catch by Processor Class in 1994					
Sector	Class		Total Discard	Total Retained	Total Catch
Inshore	ICP		2,153	167	2,321
		% of Class	92.78%	7.22%	100.00%
		% of Sector	10.72%	0.04%	0.52%
		% of BSAI	2.01%	0.01%	0.18%
	MP12		5,406	64,165	69,571
		% of Class	7.77%	92.23%	100.00%
		% of Sector	26.90%	14.99%	15.52%
		% of BSAI	5.05%	5.46%	5.43%
	SP23		11,065	349,806	360,871
		% of Class	3.07%	96.93%	100.00%
		% of Sector	55.06%	81.70%	80.51%
		% of BSAI	10.33%	29.77%	28.15%
	SP45		1,470	14,010	15,480
		% of Class	9.50%	90.50%	100.00%
		% of Sector	7.32%	3.27%	3.45%
		% of BSAI	1.37%	1.19%	1.21%
Inshore Sector Total			20,095	428,147	448,243
		% of Sector	4.48%	95.52%	100.00%
		% of BSAI	18.75%	36.44%	34.96%
Offshore	LP1		2,048	203	2,251
		% of Class	90.98%	9.02%	100.00%
		% of Sector	2.35%	0.03%	0.27%
		% of BSAI	1.91%	0.02%	0.18%
	MP12		2,961	108,045	111,006
		% of Class	2.67%	97.33%	100.00%
		% of Sector	3.40%	14.47%	13.31%
		% of BSAI	2.76%	9.20%	8.66%
	PCP		4	-	4
		% of Class	100.00%	0.00%	100.00%
		% of Sector	0.00%	0.00%	0.00%
		% of BSAI	0.00%	0.00%	0.00%
	TP1		23,464	549,245	572,709
		% of Class	4.10%	95.90%	100.00%
		% of Sector	26.96%	73.55%	68.69%
		% of BSAI	21.90%	46.75%	44.67%
	TP2		17,354	84,868	102,222
		% of Class	16.98%	83.02%	100.00%
		% of Sector	19.94%	11.37%	12.26%
		% of BSAI	16.20%	7.22%	7.97%
	TP3		41,218	4,358	45,575
		% of Class	90.44%	9.56%	100.00%
		% of Sector	47.35%	0.58%	5.47%
		% of BSAI	38.47%	0.37%	3.55%
Offshore Sector Total			87,048	746,718	833,766
		% of Sector	10.44%	89.56%	100.00%
		% of BSAI	81.25%	63.56%	65.04%
BSAI Total			107,143	1,174,865	1,282,009
		% of BSAI	8.36%	91.64%	100.00%

In the offshore sector the MP12 class gained 3% offshore total catch essentially at the expense of the TP1 and TP3 categories. Discards within the MP12 and TP1 categories fell in proportion to their total catch, but in TP2 and TP3 classes significantly. Overall, the TP3 class fared poorly compared to 1993, with their retained catch dropping from 13,066 mt to 6,412 mt.

In 1993, the small catcher-processors (ICP) are part of the inshore sector. Their catch, which was primarily discarded, more than doubled compared to 1992, accounting for 1.22% of the inshore total, but 15% of the inshore discards. Discards, as a percentage of each inshore class's total catch, increased in 1993. This may have been a function of improved discard reporting and accounting with the use of blend data. The MP12 class also gained in relative shares again in 1993 up to 17% of the sector total, while the SP23 class dropped 4% to 76%.

In the offshore sector, relative shares of the sector total remained fairly constant from 1992 to 1993. While the shares remained constant, the actual tonnage drops significantly in all major classes but the TP3 category which increased by nearly 10,000 mt to 32,000 mt. The MP12 total was down 45,000 mt, TP1 totals fell by nearly 140,000 mt, and the TP2 class dropped by 20,000 mt. On the surface this grim picture in 1993 appears to have been caused by the implementation of the Inshore Offshore. 1993 was the first full year under the allocation which reallocated roughly 10% of the BSAI total from the offshore sector to the inshore. However 1993 BSAI total harvest by the offsshore sector as reported in the blend data dropped by 181,350 mt, much more than would have been reallocated by the Amendment. 1993 was the first year of official use of the blend data to monitor attainment of the TACs. The impact of this change in quota monitoring was apparently felt primarily in the offshore sector, particularly those classes which produced surimi; TP1 and MP12 classes.

Looking at Table 4.22d, the 1994 catch totals by processing class, we see that the ICP class loses 0.7% of its share of the inshore sector, the MP12 class loses 2.25% and the Gulf shore plants lose 1.4%. The SP23 category increases its share back up to 80% of the overall inshore total. In the offshore sector, the MP12 and TP2 classes lose ground incrementally to the TP1 and TP3 classes.

In summary, the data in Tables 4.21a-d and 4.22a-d show to the effects of at least three interacting and sometimes conflicting changes in the BSAI pollock fisheries from 1991-1994. The impacts of the switch from using weekly processor reports to blend data 1993 is certainly evident. This apparent effect is without doubt exaggerated by our use of "after the fact" blend data to report catches in 1991 and 1992. Nonetheless, the impacts of this switch appear to approach that of the overall reallocation due to Inshore-Offshore. This is not to say that the Inshore-Offshore Amendment was not without impacts. The inshore sector's total harvests have increased in spite of the switch to the use of blend data. The Inshore-Offshore Amendment must be considered at least in part responsible. Within the impact of the Inshore-Offshore Amendment however we see that while the inshore sector as a whole has gained 40,000 mt since 1991, the SP45, MP12 and ICP classes within the inshore sector have gained roughly 49,000 tons while the shore plants in the SP23 class have experienced a decrease in total catches.

4.6.3 Processed Product in the BSAI Pollock Fishery

Table 4.23 reports processed products by sector for the years 1991, 1992 and 1994. We used weekly processors reports for these data, however processed product data for 1993 are unavailable at this time. Because we used blend data to calculate total harvests, we did not need to differentiate between ancillary products and primary products, and both are included in the product totals. The table uses the same "row percent/column percent" format as in earlier tables. For each three sector groups, we report the total tons of each product produced. For the inshore sector in 1991 we see that 2,815 mt of roe were produced and the total of all products equal 88,585 mt. The second row of the group shows the product as a percent of the total product for the sector. This is sometimes referred to as the product mix. Thus, roe constituted 3.2% of the inshore total product, while surimi was 50.99% of the total inshore product. The third row in the each group is a column percent showing for each product the percent each produced of the BSAI total. The inshore sectors production of fillets was 16.8% of the total fillet production from pollock caught in the BSAI for 1991.

Table 4.23

Processed Product of BSAI Pollock in 1991 by Sector								
Sector		H & G	Roe	Fillets	Surimi	Minced	Meal/Oil	Total Product
Inshore	Tons	31	2,815	11,006	45,171	2,738	26,824	88,585
	% of Class Total Product	0.04%	3.18%	12.42%	50.99%	3.09%	30.28%	100.00%
	% of BSAI Product	1.17%	13.19%	16.80%	34.24%	30.01%	45.13%	30.55%
Offshore	Tons	2,612	18,537	54,517	86,737	6,387	32,611	201,400
	% of Class Total Product	1.30%	9.20%	27.07%	43.07%	3.17%	16.19%	100.00%
	% of BSAI Product	98.83%	86.81%	83.20%	65.76%	69.99%	54.87%	69.45%
BSAI Total	Tons	2,643	21,352	65,523	131,908	9,125	59,435	289,985
	% of BSAI Product	0.91%	7.36%	22.60%	45.49%	3.15%	20.50%	100.00%

Processed Product of BSAI Pollock in 1992 by Sector								
Sector		H & G	Roe	Fillets	Surimi	Minced	Meal/Oil	Total Product
Inshore	Tons	-	4,483	9,764	65,115	4,602	37,035	120,999
	% of Sector Total Product	0.00%	3.70%	8.07%	53.81%	3.80%	30.61%	41.26%
	% of BSAI Total	0.00%	25.68%	26.46%	41.47%	33.10%	57.12%	41.26%
Offshore	Tons	3,168	12,971	27,139	91,890	9,300	27,803	172,272
	% of Sector Total Product	1.84%	7.53%	15.75%	53.34%	5.40%	16.14%	100.00%
	% of BSAI Total	100.00%	74.32%	73.54%	58.53%	66.90%	42.88%	58.74%
BSAI Total	Tons	3,168	17,454	36,903	157,005	13,902	64,838	293,270
	% of Total Catch	1.08%	5.95%	12.58%	53.54%	4.74%	22.11%	100.00%

Processed Product of BSAI Pollock in 1994 by Sector								
		H & G	Roe	Fillets	Surimi	Minced	Meal/Oil	Total Product
Inshore	Tons	2	3,309	9,631	79,677	2,686	40,801	136,106
	% of Sector Total Product	0.00%	2.43%	7.08%	58.54%	1.97%	29.98%	47.41%
	% of BSAI Total	0.18%	32.94%	23.37%	48.12%	32.46%	66.81%	100.00%
Offshore	Tons	901	6,737	31,579	85,905	5,589	20,273	150,984
	% of Sector Total Product	0.60%	4.46%	20.92%	56.90%	3.70%	13.43%	52.59%
	% of BSAI Total	99.82%	67.06%	76.63%	51.88%	67.54%	33.19%	52.59%
BSAI Total	Tons	903	10,046	41,210	165,582	8,275	61,074	287,090
	% of Total Products	0.31%	3.50%	14.35%	57.68%	2.88%	21.27%	100.00%

The offshore sector's product mix in 1991 showed relatively greater amounts of H&G, roe, and fillets than the inshore sector in the same year. Overall, the offshore sector produced 69.45% of the total product produced from BSAI pollock, but accounted for 86.8% of the roe and 83.2% of the fillets.

In 1992, the inshore sector increased its production by roughly 32,000 mt of product. The inshore sector produced 20,000 mt more surimi than in the previous year, and 10,000 mt more meal. Both roe and surimi increased as a percentage of total product in 1992, while fillets dropped in the product mix. In the offshore sector, there was a significant shift into surimi from fillets. Offshore surimi production as a percent of total offshore product increased from 43% to 53%, while fillet production dropped from 27% to 16% of the offshore production. Total tons of surimi increased by nearly 5,000 mt, while total fillet production dropped by from 54,517 tons to 27,139 tons. Roe production in the offshore sector also dropped significantly down 2% of product mix and nearly 6,000 mt overall. Overall offshore output fell by 29,000 mt to 58% of the total BSAI production.

In 1994, we see further gains in the inshore sector, increasing production in the two years to 47.4% of the overall BSAI product. Surimi increased as a proportion of product mix to 58% while roe and fillet production experienced actual and relative declines. In the offshore sector, fillet production increased in the product mix as did surimi, while roe output dropped by over 6,000 tons to account for only 4.46% of total output.

Overall, the four-year period saw a marked increase in surimi output from 131,908 mt in 1992 to 165,582 mt in 1994 from both sectors. Fillet production dropped significantly as did overall roe output. At the same time, total output remained relatively constant.

Tables 4.24a and 4.24b break down the processed product by processing class for each of the sectors for 1991 and for 1994. For the inshore sector, we aggregated all shore based plants (SP23, SP4, SP5, and SP6) for confidentiality reasons, and do not present product totals for the ICP class of processor. The production of the ICP class is included in the Inshore Sector Total however. In the offshore sector, we only report the catch of processed product of the motherships (MP12), surimi catcher-processors (TP1), fillet catcher-processors (TP2), and H&G catcher-processors (TP3). Other offshore processors are included in the offshore sector total. Because we have shown all processors in each sector, the totals seen in the "Inshore Total" and "Offshore Total" sections of each table are greater than the sum of the included processor classes. The tables use the, now familiar, "row percent/column percent" format.

Looking at Table 4.24a showing 1991, we see that motherships accounted for 11% of the overall inshore product in 1991. These motherships produced primarily fillets and minced products, accounting for 47% of the inshore fillets and 90% of the minced product. The motherships product line was rounded out by meal and oil production which accounted for 20% of the classes total product. The combined shore plants focused largely on surimi with 58% of their total product in that form. Neither of the processing classes produced roe at rates even approaching those in the offshore sector, where roe accounted for 9% of the sector's overall product. Motherships and surimi catcher-processors focused on surimi production. The surimi catcher-processors managed to salt away 10% of their overall product as roe, while 46% was in the form of surimi. Fillet catcher-processors by definition are unable to process surimi and thus focused on fillets and mince. The TP2 vessels produced significantly smaller proportions of roe than the other catcher-processors. The TP3 class, H&G processors, principle involvement in the pollock fishery in 1991 appeared to have been for the roe.

In 1994, we see very similar patterns overall. The shore plants produced significantly fewer fillets, than in 1991 and increased their surimi production. In the offshore sector, each class shows a significant reduction in roe as a percent of total product, including the TP3 class whose overall participation in the pollock fishery diminsihed by approximately 50%.

Table 4.24a

Processed Product of BSAI Pollock in 1991 by Various Processing Classes								
Sector	Processors	H & G	Roe	Fillets	Surimi	Minced	Meal/Oil	Total Product
Inshore Motherships:	Tons	-	126	5,119	18	2,478	2,040	9,780
	% of Class Total Product	0.00%	1.28%	52.34%	0.18%	25.33%	20.86%	100.00%
	% of Inshore Product	0.00%	4.46%	46.51%	0.04%	90.49%	7.60%	11.04%
Inshore Shoreplants:	Tons	-	2,686	5,811	45,073	208	24,612	78,390
	% of Class Total Product	0.00%	3.43%	7.41%	57.50%	0.27%	31.40%	100.00%
	% of Inshore Product	0.00%	95.40%	52.80%	99.78%	7.60%	91.75%	88.49%
Inshore Total:	Tons	31	2,815	11,006	45,171	2,738	26,824	88,585
	% of Inshore Product	0.04%	3.18%	12.42%	50.99%	3.09%	30.28%	100.00%
	% of BSAI Total	1.17%	13.19%	16.80%	34.24%	30.01%	45.13%	30.55%
Offshore Motherships:	Tons	-	1,535	-	18,234	126	6,707	26,602
	% of Class Total Product	0.00%	5.77%	0.00%	68.54%	0.47%	25.21%	100.00%
	% of Offshore Product	0.00%	8.28%	0.00%	21.02%	1.97%	20.57%	13.21%
Offshore Surimi CPs:	Tons	-	14,986	33,590	68,501	5,652	25,057	147,787
	% of Class Total Product	0.00%	10.14%	22.73%	46.35%	3.82%	16.95%	100.00%
	% of Offshore Product	0.00%	80.84%	61.61%	78.98%	88.50%	76.84%	73.38%
Offshore Fillet CPs:	Tons	-	1,229	19,161	-	581	820	21,791
	% of Class Total Product	0.00%	5.64%	87.93%	0.00%	2.66%	3.76%	100.00%
	% of Offshore Product	0.00%	6.63%	35.15%	0.00%	9.09%	2.51%	10.82%
Offshore H & G CPs:	Tons	1,986	733	1,268	-	-	-	3,987
	% of Class Total Product	49.81%	18.39%	31.80%	0.00%	0.00%	0.00%	100.00%
	% of Offshore Product	76.03%	3.96%	2.33%	0.00%	0.00%	0.00%	1.98%
Offshore Total:	Tons	2,612	18,537	54,517	86,737	6,387	32,611	201,400
	% of Offshore Product	1.30%	9.20%	27.07%	43.07%	3.17%	16.19%	100.00%
	% of BSAI Total	98.83%	86.81%	83.20%	65.76%	69.99%	54.87%	69.45%
BSAI Total	Tons	2,643	21,352	65,523	131,908	9,125	59,435	289,985
	% of BSAI Total	0.91%	7.36%	22.60%	45.49%	3.15%	20.50%	100.00%

Table 4.24b

Processed Product of BSAI Pollock in 1994 by Various Processing Classes								
Sector	Processors	H & G	Roe	Fillets	Surimi	Minced	Meal/Oil	Total Product
Inshore Motherships:	Tons	-	756	8,197	-	2,656	4,982	16,591
	% of Class Total Product	0.00%	4.56%	49.41%	0.00%	16.01%	30.03%	100.00%
	% of Inshore Product	0.00%	22.85%	85.11%	0.00%	98.90%	12.21%	12.19%
Inshore Shoreplants:	Tons	-	2,546	1,371	77,749	30	34,814	116,510
	% of Class Total Product	0.00%	2.19%	1.18%	66.73%	0.03%	29.88%	100.00%
	% of Inshore Product	0.00%	76.95%	14.23%	97.58%	1.10%	85.33%	85.60%
Inshore Total:	Tons	2	3,309	9,631	79,677	2,686	40,801	136,106
	% of Inshore Product	0.00%	2.43%	7.08%	58.54%	1.97%	29.98%	100.00%
	% of BSAI Total	0.18%	32.94%	23.37%	48.12%	32.46%	66.81%	47.41%
Offshore Motherships:	Tons	-	857	-	18,315	-	5,321	24,493
	% of Class Total Product	0.00%	3.50%	0.00%	74.78%	0.00%	21.73%	100.00%
	% of Offshore Product	0.00%	12.72%	0.00%	21.32%	0.00%	26.25%	16.22%
Offshore Surimi CPs:	Tons	-	4,936	18,830	65,718	2,976	14,165	106,625
	% of Class Total Product	0.00%	4.63%	17.66%	61.63%	2.79%	13.28%	100.00%
	% of Offshore Product	0.00%	73.26%	59.63%	76.50%	53.25%	69.87%	70.62%
Offshore Fillet CPs:	Tons	-	668	11,420	-	2,171	395	14,654
	% of Class Total Product	0.00%	4.56%	77.93%	0.00%	14.82%	2.69%	100.00%
	% of Offshore Product	0.00%	9.92%	36.16%	0.00%	38.84%	1.95%	9.71%
Offshore H & G CPs:	Tons	636	192	418	-	-	-	1,246
	% of Class Total Product	51.02%	15.41%	33.57%	0.00%	0.00%	0.00%	100.00%
	% of Offshore Product	70.55%	2.85%	1.32%	0.00%	0.00%	0.00%	0.83%
Offshore Total:	Tons	901	6,737	31,579	85,905	5,589	20,273	150,984
	% of Offshore Product	0.60%	4.46%	20.92%	56.90%	3.70%	13.43%	100.00%
	% of BSAI Total	99.82%	67.06%	76.63%	51.88%	67.54%	33.19%	52.59%
BSAI Total	Tons	903	10,046	41,210	165,582	8,275	61,074	287,090
	% of BSAI Total	0.31%	3.50%	14.35%	57.68%	2.88%	21.27%	100.00%

Product prices were discussed in section 4.2 above. In that section, we concluded that surimi prices have dropped considerably since 1991, that roe prices have remained high particularly when compared to surimi prices, and fillet prices dropped below surimi prices in 1992 but have regained a slight advantage over surimi in 1993. These trends have implication in the overall gross revenues. Prices for 1994 were unavailable.

Table 4.25 summarizes gross revenue for the inshore and offshore sectors for the years 1991, 1992 and 1994. We applied the prices shown previously in Table 4.1a directly to the product totals from each sector. For 1994 production, we applied 1993 prices. The table uses the same "row percent/column percent" format as in earlier tables. As an example of the table structure, we see that the offshore sector in 1991 received an estimated $190 million from roe production. This was 27% of their overall revenue for the year, and represented 89% of the total revenue derived from roe of BSAI pollock. In the same year, the offshore sector derived 24% of its overall revenue from fillet production and 44% from surimi. In total, the offshore sector brought in $685 million in gross revenue. This was 77% of the estimated gross revenue derived from BSAI pollock in 1991. The inshore sector was much more dependent on surimi, which accounted for 63% of their total gross revenue of $199 million. Roe production accounted for nearly 12% of total gross revenue and fillets were 16%.

In 1991 the inshore dependence on roe increased to 14%, while the proportion of overall revenue from fillets fell to just less than 9%. Surimi accounted for $205 million, nearly 70% of the sectors overall revenue. The inshore sector's total revenue was up to 33.8% of the gross revenue from pollock in the BSAI. The offshore sector's switch away from fillet production in 1992 resulted in an increased share of revenue for surimi, which increased to 55% of the sectors total revenue in 1992. Fillets share of gross revenue dropped to 8.8% of the overall gross. Roe continued to be a very important component of gross revenue accounting for 27% of the $578 million overall. Although offshore roe held its position relative to other offshore products, the offshore proportion of revenue derived from BSAI roe fell from 89% to 79%.

In 1994, estimated gross revenues were down significantly in both sectors, dropping from $873 million to $515 million for both sectors combined. Overall production, as seen in Table 4.23, remained relatively constant, so the dramatic slide in gross revenue can be accounted for by the changes in prices demonstrated in Table 4.2 earlier in the chapter. Comparing BSAI totals for product in 1994 with 1992, we see that revenue from roe decreased by over $97 million to just $102 million. Fillet revenues actually increased slightly, up just less than $2 million. Surimi revenues were down over nearly $250 million to $277 million in total. Inshore revenues, as a portion of BSAI revenues, increased by to 37% of the total. Clearly our picture of 1994 appears relatively bleak for both sectors compared to earlier years.

We continue our examination of the pollock industry with a comparison of gross revenue per metric ton of product produced. This is shown in Table 4.26. The ratio of gross revenue to product tons, or return to production, is a measure of the overall prices received by each sector. In 1991 and 1992 return to production of both sectors appears fairly stable. However, the inshore sector increased its return to production ratio by nearly $200 per ton, while the offshore return to production decreased by more $50 per ton. In 1994, there is a dramatic decrease which was reflected in the gross revenues in Table 4.25. Both sectors' return to production decreased significantly. The $1010.54 per ton decrease in the inshore sector amounted to 41.5% decrease from 1992 levels, while offshore returns fell $1231.75, a decrease of 36% from 1992 returns.

Table 4.25

1991 Gross Revenue From BSAI Pollock							
Sector	H & G	Roe	Fillets	Surimi	Minced	Meal/Oil	Gross Revenue
Inshore Gross Revenue	$ 18,009	$ 23,263,450	$ 32,414,302	$ 126,071,987	$ 4,231,496	$ 12,912,791	$ 198,912,036
% of InshoreGr. Revenue	0.01%	11.70%	16.30%	63.38%	2.13%	6.49%	100.00%
% of BSAI Product Gr. Rev.	0.84%	10.91%	16.54%	29.49%	29.74%	41.81%	22.50%
Offshore Gross Revenue	$ 2,113,697	$ 189,988,022	$ 163,612,255	$ 301,363,335	$ 9,997,119	$ 17,973,354	685,047,783
% of OffshoreGr. Revenue	0.31%	27.73%	23.88%	43.99%	1.46%	2.62%	100.00%
% of BSAI Product Gr. Rev.	99.16%	89.09%	83.46%	70.51%	70.26%	58.19%	77.50%
BSAI Total Gross Revenue	$ 2,131,706	$ 213,251,472	$ 196,026,557	$ 427,435,322	$ 14,228,615	$ 30,886,145	$ 883,959,818
% of BSAI Gr. Revenue	0.24%	24.12%	22.18%	48.35%	1.61%	3.49%	100.00%

1992 Gross Revenue From BSAI Pollock							
Sector	H & G	Roe	Fillets	Surimi	Minced	Meal/Oil	Gross Revenue
Inshore Gross Revenue	$ -	$ 42,309,789	$ 26,019,654	$ 205,998,195	$ 3,885,381	$ 16,751,705	$ 294,964,725
% of InshoreGr. Revenue	0.00%	14.34%	8.82%	69.84%	1.32%	5.68%	33.78%
% of BSAI Product Gr. Rev.	0.00%	21.17%	26.33%	39.14%	26.67%	52.73%	33.78%
Offshore Gross Revenue	$ 1,982,612	$ 157,540,094	$ 72,808,992	$ 320,278,334	$ 10,682,190	$ 15,017,205	$ 578,309,427
% of OffshoreGr. Revenue	0.34%	27.24%	12.59%	55.38%	1.85%	2.60%	100.00%
% of BSAI Product Gr. Rev.	100.00%	78.83%	73.67%	60.86%	73.33%	47.27%	66.22%
BSAI Total Gross Revenue	$ 1,982,612	$ 199,849,884	$ 98,828,646	$ 526,276,530	$ 14,567,571	$ 31,768,910	$ 873,274,152
% of BSAI Gr. Revenue	0.23%	22.89%	11.32%	60.26%	1.67%	3.64%	100.00%

1994 Gross Revenue From BSAI Pollock							
	H & G	Roe	Fillets	Surimi	Minced	Meal/Oil	Gross Revenue
Inshore Gross Revenue	$ 1,266	$ 26,313,540	$ 21,976,736	$ 126,121,263	$ 2,326,998	$ 17,512,136	$ 194,251,938
% of InshoreGr. Revenue	0.00%	13.55%	11.31%	64.93%	1.20%	9.02%	37.71%
% of BSAI Product Gr. Rev.	0.49%	25.71%	21.83%	45.49%	32.57%	63.73%	100.00%
Offshore Gross Revenue	$ 255,150	$ 76,028,483	$ 78,675,184	$ 151,130,510	$ 4,817,788	$ 9,966,671	$ 320,873,785
% of OffshoreGr. Revenue	0.08%	23.69%	24.52%	47.10%	1.50%	3.11%	62.29%
% of BSAI Product Gr. Rev.	99.51%	74.29%	78.17%	54.51%	67.43%	36.27%	62.29%
BSAI Total Gross Revenue	$ 256,416	$ 102,342,022	$ 100,651,920	$ 277,251,773	$ 7,144,786	$ 27,478,807	$ 515,125,723
% of BSAI Gr. Revenue	0.05%	19.87%	19.54%	53.82%	1.39%	5.33%	100.00%

Table 4.26

1991 BSAI Gross Revenue per Ton of Total Product			
		Gross Revenue	Total Product
Inshore	$	198,912,036	88,585
Revenue/Ton	$	2,245.43	
Offshore	$	685,047,783	201,400
Revenue/Ton	$	3,401.43	
BSAI Total	$	883,959,818	289,985
Revenue/Ton	$	3,048.29	

1992 BSAI Gross Revenue per Ton of Total Product			
		Gross Revenue	Total Product
Inshore	$	294,964,725	120,999
Revenue/Ton	$	2,437.75	
Offshore	$	578,309,427	172,272
Revenue/Ton	$	3,356.96	
BSAI Total	$	873,274,152	293,270
Revenue/Ton	$	2,977.71	

1994 BSAI Gross Revenue per Ton of Total Product			
		Gross Revenue	Total Product
Inshore	$	194,251,938	136,106
Revenue/Ton	$	1,427.21	
Offshore	$	320,873,785	150,984
Revenue/Ton	$	2,125.21	
BSAI Total	$	515,125,723	287,090
Revenue/Ton	$	1,794.30	

Table 4.27 compares the total production and total catch of BSAI pollock[3] of each sector for the years 1991,1992 and 1994. In 1991, the inshore sector produced 88,585 mt. overall from 407,290 mt of total catch. The ratio of total product to total catch, which is a measure of overall utilization, was 21.75%. This compared to a total product total catch ratio of 16.74% in the same year for the offshore sector. This is not an unexpected result. Inshore plants have the physical space to install meal plants and additional lines to increase their utilization. Offshore plants are much more limited in terms of physical space. Additionally, it may be argued that since the inshore sector must purchase a much higher proportion of their raw material, they will tend to utilize it more fully. What may be unexpected, but is seen in this table is the very significant gains made in utilization in the inshore sector between 1991 and 1992. The total product to total catch ratio increased by a full 33% to 28.6% overall. In this same year, the offshore's rate of utilization remained virtually the same as in 1991. This trend continuesin 1994 where the inshore sector has increased its overall recovery rate to 30%. The offshore sector has also made some gains in this area, increasing from 17% to 18% in the two year period.

The findings in Table 4.27 may indicate that relative to the offshore sector, the inshore sector increased its net revenues per ton, an approximation of producer surplus. Assume for argument, that in 1991, net revenues per ton of total catch are equal between sectors. If we apply the 1991 utilization rate to the 1992 catch we would have seen 92,038 mt. of product in the inshore, and 169,970 mt. in the offshore sector. Now assume that for every ton of actual 1992 product above these totals the processor achieves $1.00 of net revenue. The inshore sector's additional 28,960 mt of product would have given them an additional $28,960 of net revenue. The offshore sector would have gained only $2,302 in additional net revenue. Doing the same calculation for 1994 production resulted in 38,613 additional tons of product for the inshore sector and 11,397 tons of product for the offshore sector. Because we have assumed that all products generate at least $1.00 of net revenue, these conclusions are independent of new cost information, which as mentioned earlier, is not available.

Table 4.28 compares gross revenue to total catch in a similar manner to the previous table. The ratio of gross revenue to total catch is a measure of the overall value added. In 1991, the return to total catch for the inshore sector is estimated to be $488.38 per mt. This compares to the offshore sectors gross revenue to total catch ratio of $569.46 per mt. This finding is not unexpected either given that the prices for offshore in most categories are higher than for the inshore sector. In 1992 however a dramatic shift occurs. The inshore sector's per ton return to total catch increases to $697.04 per ton, an increase of over $200/mt. In the same year, the offshore sector's per ton return to total catch remained virtually identical to the previous year. In 1994 overall returns are significantly lower for both sectors, the inshore sector retains its apparent edge however with a per ton return to total catch of $433 compared to $385 for the offshore sector. Another important comparison are the decreases in the ratio of gross revenue to total catch from 1991 to 1994. The decrease in gross revenue per catch for from 1991 to 1994 for the inshore sector was $55.02, a drop of 11.3%. For the offshore sector the decrease was more significant, down $185, a 32.6% drop. For the offshore sector these changes reflect the greater amount of relatively lower valued surimi, and lower amounts relatively higher priced fillets and roe.

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[3] It has been suggested that comparing total product to total catch is misleading because of increased regulatory discards in the "closed" season and that a calculation of "utilization rates" should compare total product to retained catch. The analysts note that the allocation of pollock to the inshore and offshore sectors includes all harvests whether they occur in directed fishing operations or at times when directed fishing is prohibited, therefore the utilization rate looking at total catch is more appropriate. Nonetheless, "retained catch utilization rates" were calculated for both sectors and are shown in the table below.

Retained Catch Utilization Rates	1991	1992	1994
Inshore	22.5%	29.5%	31.8%
Offshore	19.5%	19.2%	20.2%

Table 4.27

Production and Total Catch of Pollock in the BSAI in 1991			
		Total Product	Total Catch
Inshore	Tons	88,585	407,290
	Product/Total Catch (PRR)	21.75%	
Offshore	Tons	201,400	1,202,980
	Product/Total Catch (PRR)	16.74%	
BSAI Total	Tons	289,985	1,610,270
	Product/Total Catch (PRR)	18.01%	

Production and Total Catch of Pollock in the BSAI in 1992			
		Total Product	Total Catch
Inshore	Tons	120,999	423,167
	Product/Total Catch (PRR)	28.59%	
Offshore	Tons	172,272	1,015,245
	Product/Total Catch (PRR)	16.97%	
BSAI Total	Tons	293,270	1,438,412
	Product/Total Catch (PRR)	20.39%	

Production and Total Catch of Pollock in the BSAI in 1994			
		Total Product	Total Catch
Inshore	Tons	136,106	448,243
	Product/Total Catch (PRR)	30.36%	
Offshore	Tons	150,984	833,766
	Product/Total Catch (PRR)	18.11%	
BSAI Total	Tons	287,090	1,282,009
	Product/Total Catch (PRR)	22.39%	

Table 4.28

1991 BSAI Gross Revenue per Ton of Total Catch			
		Gross Revenue	Total Catch
Inshore	$	198,912,036	407,290
Revenue/Ton	$	488.38	
Offshore	$	685,047,783	1,202,980
Revenue/Ton	$	569.46	
BSAI Total	$	883,959,818	1,610,270
Revenue/Ton	$	548.95	

1992 BSAI Gross Revenue per Ton of Total Catch			
		Gross Revenue	Total Catch
Inshore	$	294,964,725	423,167
Revenue/Ton	$	697.04	
Offshore	$	578,309,427	1,015,245
Revenue/Ton	$	569.63	
BSAI Total	$	873,274,152	1,438,412
Revenue/Ton	$	607.11	

1994 BSAI Gross Revenue per Ton of Total Catch			
		Gross Revenue	Total Catch
Inshore	$	194,251,938	448,243
Revenue/Ton	$	433.36	
Offshore	$	320,873,785	833,766
Revenue/Ton	$	384.85	
BSAI Total	$	515,125,723	1,282,009
Revenue/Ton	$	401.81	

4.6.4 Summary and Conclusions

The examination of the BSAI pollock processing industry above compares and contrasts the catch, production and returns of the inshore and offshore sector of the industry for the period 1991-1994. The Inshore-Offshore Amendment was implemented in June 1992, so the portrait of the industry above includes the period immediately prior to the Amendment and immediately following.

In general, the period was marked by a significant decrease in surimi and fillet prices. We also noted the possible ramifications of the changes from the use of weekly processor reports to the use of blend data. This change in monitoring tactics by NMFS, along with the inshore-offshore allocation, brought estimated harvest levels in the offshore sector down dramatically. The implications of the inclusion of motherships and inshore catcher-processors (ICP) in the "inshore" sector were also explored. We examined production patterns and changes in product mixes and finally looked at utilization rates, returns to production and returns to total catch, noting the significant relative increase in utilization rates experienced by the inshore sector, and less of a reduction in revenues/catch for the inshore sector.

Absent from this examination is cost information. As mentioned above, no new cost information has become available since the "OMB Survey" and work done in the "Supplemental Analysis." At that time, overall costs for the offshore sector were believed to be lower in the offshore sector than in the onshore sector. If costs are sufficiently low, then processors with lower revenues may be more "efficient" than processors with higher returns and perhaps higher costs. With no new information regarding costs, we can only assume that costs have stayed the same, or if they have changed, they have changed in the same proportion for both sectors.

4.6.4.1 Comparison to the Supplemental Analysis

The Supplemental Analysis predicted that changes in overall net benefits resulting from the Inshore-Offshore Amendment would more likely be negative than positive. An examination of the prices, assumed in that analysis in Table 4.2, revealed that predicted prices did not hold into 1993 and 1994. Surimi prices in particular were significantly lower than modeled prices for both sectors. This implies that overall gross revenues for the entire industry dropped. If costs are assumed to be constant for both sectors, then overall net revenues declined. An overall decrease in net revenues does not, in and of itself, imply that the modeled results changed; those results measured the differences in inshore and offshore net revenues, and therefore the difference in net revenue must change in order for a change in overall results.

As an example of this effect, let us assume that the inshore sector had \$200 per round weight ton of net revenue from surimi, and that the offshore sector had a net revenue of \$250 per ton. Shifting one ton to the inshore sector would result in an overall loss in total net revenue of \$50. If prices decline in both sectors by the same amount, then the difference in net revenues will remain unchanged. In this example, a decrease in the price of surimi of \$50 per ton will reduce inshore net revenues to \$150, and offshore net revenues to \$200 per ton. The difference in net revenue remains constant at \$50. If however price changes are <u>not of the same absolute size</u> in both sectors then there will be a change in the <u>difference</u> in net revenues by sector, assuming there has been no change in cost. In the same example, a \$55 decrease in the price of offshore surimi coupled with a \$50 decrease in the inshore surimi price, would result in \$45 difference in net revenues by sector. A smaller difference in net revenue will shift the overall impacts of the allocation toward the neutral point.

Comparing the "Supplemental" prices to 1993 prices in Table 4.2, we see that the inshore roe price is \$0.183/lb less than modeled, while the offshore price is \$.006/lb less than modeled. Fillet prices are \$0.455/lb and \$0.220 less than modeled for the inshore and offshore sectors respectively. Finally surimi prices are down \$0.647/lb for the inshore sector and \$0.737/lb for the offshore sector. These price changes by themselves will have mixed impacts in the overall outcome of the Supplemental Analysis. Assuming again that costs of production for each product have remained unchanged, the smaller absolute decreases experienced by the offshore sector in prices for fillets and roe would tend to shift the expected net benefits (loss) from the Inshore-Offshore Amendment to the left, or more towards a loss to the nation. On the other hand, the smaller absolute decrease in surimi prices for the inshore sector would tend to move the expected net benefits (loss) from the Inshore-Offshore Amendment to the right, or back toward a more neutral finding.

Another important assumption imbedded in the Supplemental Analysis concerned the product mix of the different sectors. These can be inferred from Table 2.6, on page 2-10 of that document, by calculating the ratio of each product to the sum of the products. We show these calculations in Table 4.29 below. The fact that the table uses the assumptions from Alternative 3 rather than allocation as implemented is irrelevant because the importance of this table in the current context of the "product mix" in the second row for each class. This was assumed constant in the Supplemental Analysis, regardless of the alternative examined.

Comparing these product mixes to those in Table 4.23 shows that the offshore sector increased its emphasis on surimi in 1994 compared to the modeled product mix, increasing from 46% in the model to 57% in 1994. The inshore sector also increased its surimi production by 4% relative to total production. As noted above, offshore surimi prices have fallen more than inshore surimi prices in an absolute sense. The effect of the offshore sector's shift to greater relative amounts of surimi than fillets and roe, coupled with the greater absolute decrease in offshore surimi prices, and the assumption that costs have remained constant, leads to the conclusion that the offshore sector's net revenue per ton has fallen relative to the that of the inshore sector, i.e., the difference in net revenues per ton of the allocation has shifted in the direction of zero relative to the assumptions in the Supplemental Analysis. This implies that losses to the nation, as predicted in the Supplemental Analysis, appear to have been overstated.

Table 4.30 shows the approximate gross revenue by sector used in the Supplemental Analysis under Alternative 3 in that analysis. This information is based on the product mixes shown in the Table 4.29, amounts of total product assumed in the analysis, and prices using the average between the "NMFS" and "Industry" percentages. This information is included for reference purposes only, as the relevant comparisions are found not in the overall gross revenues, but in the gross revenue per ton of product and gross revenue per ton of catch which are developed in the next tables.

Table 4.31 shows the utilization rates assumed in the Supplemental Analysis. These are higher than those documented for 1991 for both the inshore and offshore sectors as shown in Table 4.27. However, in 1992 and 1994, the inshore sector's utilization rate is higher than the modeled rate, while that of the offshore sector remains below that seen in the model. As discussed in Section 4.6.3, this also leads to the inference that net revenues or producer surplus in the inshore sector is greater than was modeled, given the same assumptions that production costs per ton of product have not changed, and draws the conclusion that the expected net losses of the Inshore-Offshore Amendment were overstated.

Table 4.32 showing the ratio of gross revenue to total product implied in the Supplemental Analysis is included for reference as is Table 4.31 showing the ratio of gross revenue to total catch. Total Revenues per product in the model were very similar to those seen in 1991 and 1992, but exceeded 1994 revenues by $988.01 inshore and $1,438.41 offshore. Gross revenue per total catch seen in Table 4.33 appears significantly overstated compared to inshore numbers for 1991, but are more closely matched to 1992 numbers, and then far exceed the 1994 numbers. The offshore estimates in the model exceeded estimates of offshore revenues for the years 1991-1994 by even greater amounts than was seen inshore. All these findings reinforce the general conclusion that the losses to the Nation projected in the Supplemental Analysis were overstated. In other words, the actual impacts of the Inshore-Offshore Amendment, compared to the predicted impacts as seen in the Figures 2.2 and 2.3 on pages 22 and 23, appear to be farther to the right, toward a more neutral point. These conclusions, of course must be tempered with the caveat that no new cost data are available, and that cost information is an integral component of any economic impact assessment.

Table 4.29

Average Processed Product Mix Assumed in the Supplemental Analysis: Alternative 3						
Sector	Roe	Fillets	Surimi	Minced	Meal/Oil	Total Product
Inshore Tons	3,633	15,067	65,717	3,717	31,733	119,867
% of Class Total Product	3.03%	12.57%	54.82%	3.10%	26.47%	100.00%
% of BSAI Product	21.21%	26.36%	48.93%	39.89%	62.40%	44.60%
Offshore Tons	13,500	42,083	68,583	5,600	19,122	148,889
% of Class Total Product	9.07%	28.26%	46.06%	3.76%	12.84%	100.00%
% of BSAI Product	78.79%	73.64%	51.07%	60.11%	37.60%	55.40%
BSAI Total Tons	17,133	57,150	134,300	9,317	50,856	268,756
% of BSAI Product	6.38%	21.26%	49.97%	3.47%	18.92%	100.00%

Table 4.30

Gross Revenue As Assumed in the Supplemental Analysis: Alternative 3						
Sector	Roe	Fillets	Surimi	Minced	Meal/Oil	Total Product
Inshore Revenue	$ 30,358,077	$ 49,491,800	$ 197,759,785	$ 5,571,759	$ 18,189,420	$ 301,370,841
% of Class Revenue	10.07%	16.42%	65.62%	1.85%	6.04%	100.00%
% of BSAI Revenue	16.60%	28.32%	46.01%	36.36%	62.40%	36.22%
Offshore Tons	$ 152,530,763	$ 125,248,838	$ 232,090,184	$ 9,753,150	$ 10,960,781	$ 530,583,715
% of Class Revenue	28.75%	23.61%	43.74%	1.84%	2.07%	100.00%
% of BSAI Revenue	83.40%	71.68%	53.99%	63.64%	37.60%	63.78%
BSAI Total Revenue	$ 182,888,839	$ 174,740,638	$ 429,849,969	$ 15,324,909	$ 29,150,201	$ 831,954,556
% of BSAI Revenue	21.98%	21.00%	51.67%	1.84%	3.50%	100.00%

Table 4.31

The Ratio of Production to Total Catch of Pollock in the BSAI as Modeled		
	Total Product	Total Catch
Inshore	119,867	477,941
Utilization Rate	25.08%	
Offshore	148,889	679,790
Utilization Rate	21.90%	
BSAI Total	268,756	1,157,731
Utilization Rate	23.21%	

Table 4.32

The Ratio of Gross Revenue to Total Product of Pollock in the BSAI as Modeled		
	Gross Revenue	Total Product
Inshore	$ 301,370,841	119,867
Revenue/Product	$ 2,514.22	
Offshore	$ 530,583,715	148,889
Revenue/Product	$ 3,563.62	
BSAI Total	$ 831,954,556	268,756
Revenue/Product	$ 3,095.58	

Table 4.33

The Ratio of Gross Revenue to Total Catch of Pollock in the BSAI as Modeled		
	Total Product	Total Catch
Inshore	$ 301,370,841	477,941
Revenue/Catch	$ 630.56	
Offshore	$ 530,583,715	679,790
Revenue/Catch	$ 780.51	
BSAI Total	$ 831,954,556	1,157,731
Revenue/Catch	$ 718.61	

4.6.4.2 Implications Regarding the Distributional Impacts Assumed in the Supplemental Analysis

The impact on the distribution impacts assumed in the Supplemental Analysis compared to what is estimated to have occurred in the Base Case period 1991-1994. In a nutshell, distributional impacts are driven by gross revenues with the assumption that the greater the amount of gross revenues, the greater the overall expenditures. The increases in gross revenue accruing to the inshore sector relative to those in the offshore sector imply that for each ton going to the inshore sector a greater amount will be expended in the communities which support the fishing industry. This will be the case regardless of whether those communities are located in Alaska or in Seattle. Tempering this conclusion will be relative amounts of foreign ownership in the two sectors. The findings in the SEIS and in the Supplemental Analysis indicated that the inshore sector expenditures occurred to a relatively greater amount in Alaskan communities compared to the offshore sector.

4.6.5 Overall Conclusions Regarding BSAI Pollock in the Base Case

While it is clear that the Inshore-Offshore Amendment had an impact on both the inshore and offshore sectors, it is doubtful that all of the changes which occurred were caused solely by the allocation. In 1992, the inshore sector increased its production of roe which gave it added revenue. Additionally, the significant gains made by the inshore sector in the utilization rate, as we have called the product to total catch ratio, are difficult to pin to the Inshore-Offshore Amendment.

Overall, it is clear that the industry revenues are lower in 1994 than in 1991, and that relative to the offshore sector, the inshore sector has apparently done more to increase their revenue per ton of catch. Both of these conclusions imply that the overall impacts of the Inshore-Offshore Amendment on overall net losses to the nation, as depicted in the "Supplemental Analysis," were not realized. Any losses due to the allocation which were projected in that analysis appear to have been overstated, and are much more likely to be neutral, bearing in mind that these conclusions were made without updated cost information, a critical parameter in any cost/benefit analysis.

5 PROJECTED OUTCOMES UNDER ALTERNATIVE 1: ALLOW AMENDMENT 18/23 TO EXPIRE

This Chapter makes projections regarding the consequences of Alternative 1 which would allow the Inshore-Offshore Amendment to expire. As in Chapter 4, we will examine the three different fisheries included in the amendments, however we will reverse the order. First, we will look at the BSAI pollock fishery, followed by the GOA pollock and Pacific cod fisheries.

5.1 PROJECTIONS OF THE BSAI POLLOCK FISHERY UNDER ALTERNATIVE 1

If Alternative 1 is implemented, the current inshore-offshore allocation will be deleted from the regulations, along with the CVOA and CDQ allocations. The consequences of the elimination of the CDQ allocation are discussed in Chapter 9. The CVOA was addressed to considerable extent in Chapter 3, but we will touch on some key issues later in this section.

5.1.1 Projections of Total Harvest Under Alternative 1

BSAI pollock TACs have remained relatively stable for the last several years, fluctuating between 1.387 million mt and 1.307 million mt. There does not appear to be any cause to predict much change in the overall TACs. Therefore, for explanatory ease, we will assume that future TACs and therefore future harvests will be equal to those experienced in 1994. In that year, the TAC was 1,387,600 mt, with 7.5% allocated to CDQs. The total non-CDQ harvest was 1,282,009 mt as seen in Table 4.21d. Although the CDQ allocation will not be continued under this alternative, we will assume that future catch in the BSAI pollock will equal 1,282,009. This will make it easier to check and verify the assumptions we will make in the text that follows.

Predicting harvests by the two sectors is much more difficult than the projection of total harvest made in the preceding paragraph. Future harvest splits without Inshore-Offshore in the Original and Supplemental Analyses were assumed to have remained at the levels experienced in the previous years. In the Supplemental Analysis, the projected harvest of the inshore sector 26.6% compared to the offshore sector's 73.4%. To assume that this split is a feasible projection for 1996-1998 is questionable given the dynamics of the fishery. Therefore, alternative methods to predict the unallocated harvest splits were examined. These included: (1) the relative split found by summing the seasonal average weekly total catch of each processor in each sector, and (2) the relative split found by summing the seasonal maximum weekly catch. Because the offshore seasons have been shorter than inshore seasons under the allocation, it is assumed that under Alternative 1, the offshore sector will experience relatively longer seasons and the inshore sector will experience relatively shorter seasons. This assumption will hold unless the projected outcomes under this alternative result in a greater percent of the catch going to the inshore sector.

5.1.1.1 Projections of the Inshore and Offshore Split Using Average Weekly Catch

Using average weekly catch to project sector split under Alternative 1, assumes that each processor will operate in the same manner and at the same rate of production as in previous years. Further, it is assumed that lack of an allocation does not increased the overall rate at which individual processors prosecute the fishery . While this may not be entirely believable, there may not be any evidence that with the allocation processors act at a more leisurely pace. It appears, in fact, that intra-sector competition remains a factor for both sectors of the industry.

To calculate the inshore-offshore harvest split using weekly averages, the following methodology was employed.

(1) Calculate the total catch of pollock by each processor over all management zones in the BSAI for each week in the 'A' and 'B' seasons. Catch during closed periods was not considered in these calculations as it was felt that this would skew the results.

(2) Calculate the average weekly catch for each processor for each season.

3) Sum the average weekly catch of each processor within their respective sectors for each season.

4) The inshore 'A' season catch percentage equals the ratio of the sum of the inshore averages to the sum of averages of all processors for the season. The offshore 'A' season catch percentage is similarly determined, as are catch percentages for the 'B' season.

5) Each sector's total 'A' season catch is found by multiplying the calculated catch percentage by the total catch from the 1994 'A' season.

6) Each sector's total for the 'B' season is found in a similar manner.

Predicting pollock catches when directed fishing is closed is problematic. The average catch methodology appears inappropriate because of the relatively small and sporadic involvement of the various processors. Therefore, we have assumed that catch during closed seasons will remain constant at 1994 levels. These catch amounts are seen in Table 4.21d.

Tables 5.1a-d show the average catch, as calculated above for each sector, for the years 1991 through 1994. These tables are constructed with the "row percent/column percent" format used in Chapter 4, and represent the methodology depicted above through step 4. For example, in Table 5.1a, we see that the sum of the average catches for the inshore sector in 1991 was 14,302 mt. In other words, on average, the inshore sector harvested 14,302 tons per week when the 'A' season was open. This compares to the inshore sector's average 'B' season weekly total of 17,671 mt. The offshore sector averaged 53,806 mt per week in the 'A' season and 45,841 per week in the 'B' season. The average weekly catch for the BSAI in the 'A' season is 68,108 mt. and 63,512 mt for the 'B' season. These are calculated by summing the inshore average and the offshore for each season. The inshore sector's proportion of the 'A' and 'B' seasons are shown at 21% and 27.8% respectively. The offshore averages represent 79% and 72.2% of the BSAI season averages.

Looking through Tables 5.1b-d, we can see that the average weekly catch of the inshore sector grows as a percent of the BSAI average for each season through 1993. In that year, the inshore 'A' season proportion was 29.7% of the total, and the 'B' season amounted to 31.9%. In 1994, the inshore 'B' season split continued upward to 32.4%, but the 'A' season split decreased to 26.1%. For the most part, these results are as expected as new shore-based processing capacity becomes fine tuned.

The average catches in 1991 are approximately equal to the harvest splits actually experienced in the 1991 fishery. This is an indicator that this methodology may be an appropriate indicator of harvest splits in the no-allocation scenario. As expected, average weekly harvest by the inshore sector for 1992-1994 results in smaller harvest percentages than were experienced under the inshore-offshore allocation.

Table 5.2 shows the results of applying the 1994 seasonal average weekly catch to the 1994 total BSAI harvest. Compare this table to both Tables 5.1d and Table 4.21d. Notice that the "% of the BSAI 'A' Season Total" and "% of the BSAI 'B' Season Total" for both sectors are identical to the numbers found in Tables 5.1a. Also notice that the total catches shown in the "BSAI 'A' Season Total," "BSAI 'B' Season Total," "BSAI Closed Season Total," "BSAI Total," groups at the bottom of Table 5.2 are the same as those found in Table 4.21d. Finally note that we have assumed that catches during closed seasons would remain the same as those experienced in 1994. Using the parameters identified in this paragraph, we calculated the remainder of Table 5.2.

Table 5.1a

Average Weekly BSAI Pollock Catch Within Seasons Summed By Sector in 1991			
Sector Season	Total Discarded	Total Retained	Total Catch
Inshore A Season	350	13,953	14,302
% of Sector A Season Total	2.44%	97.56%	100.00%
% of BSAI A Season Total	5.22%	22.72%	21.00%
Inshore B Season	257	17,414	17,671
% of Sector B Season Total	1.45%	98.55%	100.00%
% of BSAI B Season Total	4.90%	29.89%	27.82%
Offshore A Season	6,343	47,463	53,806
% of Sector A Season Total	11.79%	88.21%	100.00%
% of BSAI A Season Total	94.78%	77.28%	79.00%
Offshore B Season	4,988	40,854	45,841
% of Sector B Season Total	10.88%	89.12%	100.00%
% of BSAI B Season Total	95.10%	70.11%	72.18%
BSAI Total A Season	6,693	61,416	68,108
% of BSAI A Season Total	9.83%	90.17%	100.00%
BSAI Total B Season	5,244	58,268	63,512
% of BSAI B Season Total	8.26%	91.74%	100.00%

Table 5.1b

Average Weekly BSAI Pollock Catch Within Seasons Summed By Sector in 1992			
Sector Season			
Inshore A Season	457	12,654	13,112
% of Sector A Season Total	3.49%	96.51%	100.00%
% of BSAI A Season Total	6.50%	22.28%	20.55%
Inshore B Season	527	20,571	21,097
% of Sector B Season Total	2.50%	97.51%	100.00%
% of BSAI B Season Total	8.31%	30.39%	28.50%
Offshore A Season	6,573	44,130	50,703
% of Sector A Season Total	12.96%	87.04%	100.00%
% of BSAI A Season Total	93.50%	77.72%	79.45%
Offshore B Season	5,807	47,116	52,923
% of Sector B Season Total	10.97%	89.03%	100.00%
% of BSAI B Season Total	91.69%	69.61%	71.50%
BSAI Total A Season	7,030	56,784	63,815
% of BSAI A Season Total	11.02%	88.98%	100.00%
BSAI Total B Season	6,334	67,687	74,020
% of BSAI B Season Total	8.56%	91.44%	100.00%

Table 5.1c

Average Weekly BSAI Pollock Catch Within Seasons Summed By Sector in 1993			
Sector Season			
Inshore A Season	1,904	17,592	19,496
% of Sector A Season Total	9.77%	90.23%	100.00%
% of BSAI A Season Total	25.08%	30.26%	29.66%
Inshore B Season	666	29,858	30,525
% of Sector B Season Total	2.18%	97.81%	100.00%
% of BSAI B Season Total	17.28%	32.46%	31.85%
Offshore A Season	5,689	40,540	46,229
% of Sector A Season Total	12.31%	87.69%	100.00%
% of BSAI A Season Total	74.92%	69.74%	70.34%
Offshore B Season	3,191	62,126	65,317
% of Sector B Season Total	4.89%	95.11%	100.00%
% of BSAI B Season Total	82.72%	67.54%	68.15%
BSAI Total A Season	7,593	58,132	65,725
% of BSAI A Season Total	11.55%	88.45%	100.00%
BSAI Total B Season	3,857	91,984	95,842
% of BSAI B Season Total	4.02%	95.97%	100.00%

Table 5.1d

Average Weekly BSAI Pollock Catch Within Seasons Summed By Sector in 1994			
Sector Season			
Inshore A Season	798	21,224	22,022
% of Sector A Season Total	3.62%	96.38%	100.00%
% of BSAI A Season Total	14.34%	26.94%	26.11%
Inshore B Season	256	29,937	30,193
% of Sector B Season Total	0.85%	99.15%	100.00%
% of BSAI B Season Total	4.80%	34.08%	32.40%
Offshore A Season	4,766	57,551	62,317
% of Sector A Season Total	7.65%	92.35%	100.00%
% of BSAI A Season Total	85.66%	73.06%	73.89%
Offshore B Season	5,085	57,904	62,989
% of Sector B Season Total	8.07%	91.93%	100.00%
% of BSAI B Season Total	95.20%	65.92%	67.60%
BSAI Total A Season	5,564	78,775	84,339
% of BSAI A Season Total	6.60%	93.40%	100.00%
BSAI Total B Season	5,341	87,841	93,182
% of BSAI B Season Total	5.73%	94.27%	100.00%

Table 5.2

Projected BSAI Pollock Catch By Season Under Alternative 1 Using 1994 Averages			
Sector	Discarded Catch	Retained Catch	Total Catch
Inshore A Season	5,414	143,998	149,412
% of Sector Season Total	3.62%	96.38%	100.00%
% of BSAI A Season Total	14.34%	26.94%	26.11%
Inshore B Season	1,756	204,956	206,709
% of Sector Season Total	0.85%	99.15%	100.00%
% of BSAI A Season Total	4.80%	34.08%	32.40%
Inshore Closed Season	11,509	6,136	17,646
% of Sector Season Total	65.22%	34.78%	100.00%
% of BSAI Closed Season Total	25.90%	22.39%	24.56%
Inshore Sector Total	18,679	355,091	373,767
% of Sector Total	5.00%	95.00%	100.00%
% of BSAI Total	17.43%	30.22%	29.15%
Offshore A Season	32,335	390,465	422,801
% of Sector Season Total	7.65%	92.35%	100.00%
% of BSAI A Season Total	85.66%	73.06%	73.89%
Offshore B Season	34,812	396,425	431,238
% of Sector Season Total	8.07%	91.93%	100.00%
% of BSAI A Season Total	95.20%	65.92%	67.60%
Offshore Closed Season	32,928	21,275	54,203
% of Sector Season Total	60.75%	39.25%	100.00%
% of BSAI Closed Season Total	74.10%	77.61%	75.44%
Offshore Sector Total	100,075	808,165	908,242
% of Sector Total	11.02%	88.98%	100.00%
% of BSAI Total	93.40%	68.79%	70.85%
BSAI Total A Season	37,749	534,463	572,213
% of Season Total	6.60%	93.40%	100.00%
% of BSAI Total	35.23%	45.49%	44.63%
BSAI Total B Season	36,568	601,381	637,947
% of Season Total	5.73%	94.27%	100.00%
% of BSAI Total	34.13%	51.19%	49.76%
BSAI Total Closed Season	44,437	27,411	71,849
% of Season Total	61.85%	38.15%	100.00%
% of BSAI Total	41.47%	2.33%	5.60%
BSAI Total	107,143	1,174,865	1,282,009
% of BSAI Total	8.36%	91.64%	100.00%

Looking at the "Inshore Sector Total," we see that when average weekly catches are applied to 1994, the total catches result in 29.15% of the harvest going to the inshore sector under Alternative 1. The remaining 70.85% of the harvest is projected to be taken by the offshore sector. These splits result in a total inshore harvest of 373,767 mt, and 908,242 mt. for the offshore sector.

5.1.1.2 Projections of the Inshore and Offshore Split Using Maximum Catch

An alternative to using the sum of the average weekly catch by sector is to use the maximum weekly catch of each processor. This methodology assumes that without an inshore-offshore allocation, the "race for fish" would intensify and processors would stress throughput, perhaps making some sacrifices in utilization.

We used a similar methodology to the calculation of weekly maximums, first summing the blend data over all BSAI zones for each week by processors. Then we found the maximum amount of catch for each processor in both the 'A' and 'B' seasons, and summed these maximums according to sector. These results are shown in Tables 5.3a-d which use the same format as Tables 5.1a-d.

In this set of tables, we see that when compared to the average weekly catches, using the maximum catch yields a lower percentage split for the inshore sector, for each season in the four years, with the exception of the 'A' season in 1992. Overall this result is not unexpected given the apparent higher level of competition seen in the offshore sector. A demonstration of this was seen in the 1992 'B' season, when inshore harvesters delayed fishing in order to increase fish sizes.

Table 5.4 uses the methodology employed to calculate Table 5.2 to apply the 1994 maximum weekly harvests by sector and season to the 1994 harvest. This may be checked by comparing Table 5.4 to Tables 4.21d and 5.3d. Using this methodology, the inshore sector is projected to harvest 326,405 mt, 25.46% of the overall BSAI pollock total, while the offshore sector is projected to harvest 955,604 mt.

Note that the estimates derived using the average catches approximate the harvest splits seen in 1991 better than estimates derived using maximum catches. This is an important consideration because we are attempting to project catches under a "no allocation scenario," and 1991 was the last full year in which there was no allocation.

5.1.2 Projections of Processed Product Under Alternative 1

Given the sector harvest totals from Tables 5.2 and Table 5.4, we applied the ratio of total product to total catch, the "utilization rate," to calculate the total product of product for each sector. The results are shown in Tables 5.5a and 5.5b. Using seasonal averages, 113,492 tons of product would be projected for the inshore sector, and 164,471 for the offshore sector. Using seasonal maximums, 272,158 mt would be produced; 99,111 mt inshore and 173,047 mt offshore.[1]

We then took the product totals from these projections and applied the 1994 product mixes from Table 4.23. These resulted in the product amounts shown in Tables 5.6a and 5.6b. We then applied the 1993 product prices to calculate sector revenues. The results of all these calculations are seen in Tables 5.7a and 5.7b. The former shows the products and gross revenues using seasonal averages, while the latter shows the result if seasonal maximums are used. Using either methodology, we note that overall gross revenues for the BSAI decline from those estimated for 1994 shown in Table 4.25.

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[1]This methodology ignores seasonal variations in product mix, and therefore will slightly understate the amount of roe produced in the offshore sector, and slightly overstate the amount of roe produced by the inshore sector. It will also overstate the amount of offshore surimi and fillets, but understate the amount of inshore surimi and fillets. Sensitivity testing of this issue revealed that these differences are very unlikely to influence the overall results of the projections.

As a last step in our projections, we take the projected gross revenues and compare them to projected total catch. The results are shown in Table 5.8a using the averages, and Table 5.8b using the maximums. Not surprisingly, the gross revenue to total catch ratios for each sector are identical in both tables to the ratios for 1994 shown in Table 4.28. This, of course, is a function of the methodology employed and linear nature of our assumptions. It also points out the relative importance of the findings that gross revenues to total catch are relatively higher in 1994 for the inshore sector than in the offshore sector when compared to 1991 figures and to estimates used in the Supplemental Analysis. Under either of the methodologies, however, the ratio of BSAI total revenue to BSAI total catch declines from those seen in 1994. Using seasonal averages the projected total gross revenue for the BSAI is $511.5 million compared to $509.2 million when using the maximums. The total gross revenue falls when a greater amount is assumed to be harvested by the offshore sector. This not only has net benefit impacts but also implications to projected distributional changes, as lower per ton revenue will reduce the direct income effect overall.

5.1.3 Implications of Projected Outcomes Compared To Earlier Analyses of Economic Indicators

As discussed in Chapter 4, price changes and changes in utilization rates suggest that the overall predicted net losses to the nation in the Supplemental Analysis were most likely overstated. The findings in this section add to the certainty of this conclusion. The Supplemental Analysis assumed that under the "no allocation" scenario catch splits would be 26.6% inshore and 73.4% offshore if NMFS parameters were used. The estimates of harvest splits under Alternative 1, as described in this section, project harvest splits of 29.15% and 70.85%.

Implicit in the results of the Supplemental Analysis, is that there will be a decrease in overall net benefits to the Nation of $2.38 million (excluding NPV adjustments) for every percentage shift in the harvest to the inshore sector for each year the allocation is in effect. A 26.6% harvest by the inshore sector was assumed in the Base Case of the supplemental for each year through 1995. The findings in this section however indicate that, using weekly seasonal averages to predict the "no-allocation" scenario for 1994, the inshore sector would have harvested 29.15%. This is a 2.55% reduction in the shift for 1994 and assumedly for 1995. This implies that the overall losses to the Nation were overstated in the Supplemental Analysis by at least $12.1 million. Factoring in the conclusions regarding changes in prices, product mix, and utilization rates, and remembering that we have no new information regarding cost and assume therefore that costs per ton of product have remained constant for both sectors, it seems almost certain that the overall losses projected in the Supplemental were not realized.

Table 5.3a

Maximum Weekly BSAI Pollock Catch Within Seasons Summed By Sector in 1991			
Sector Season	Total Discarded	Total Retained	Total Catch
Inshore A Season	478	22,010	22,488
% of Sector A Season Total	2.13%	97.87%	100.00%
% of BSAI A Season Total	3.27%	19.96%	18.01%
Inshore B Season	150	31,722	31,872
% of Sector B Season Total	0.47%	99.53%	100.00%
% of BSAI B Season Total	1.86%	28.62%	26.80%
Offshore A Season	14,133	88,259	102,392
% of Sector A Season Total	13.80%	86.20%	100.00%
% of BSAI A Season Total	96.73%	80.04%	81.99%
Offshore B Season	7,941	79,113	87,054
% of Sector B Season Total	9.12%	90.88%	100.00%
% of BSAI B Season Total	98.14%	71.38%	73.20%
BSAI Total A Season	14,611	110,269	124,880
% of BSAI A Season Total	11.70%	88.30%	100.00%
BSAI Total B Season	8,091	110,835	118,926
% of BSAI B Season Total	6.80%	93.20%	100.00%

Table 5.3b

Maximum Weekly BSAI Pollock Catch Within Seasons Summed By Sector in 1992			
Sector Season	Total Discarded	Total Retained	Total Catch
Inshore A Season	569	25,916	26,485
% of Sector A Season Total	2.15%	97.85%	100.00%
% of BSAI A Season Total	5.11%	24.55%	22.70%
Inshore B Season	731	31,702	32,433
% of Sector B Season Total	2.25%	97.75%	100.00%
% of BSAI B Season Total	8.30%	27.73%	26.34%
Offshore A Season	10,572	79,632	90,204
% of Sector A Season Total	11.72%	88.28%	100.00%
% of BSAI A Season Total	94.89%	75.45%	77.30%
Offshore B Season	8,081	82,608	90,689
% of Sector B Season Total	8.91%	91.09%	100.00%
% of BSAI B Season Total	91.70%	72.27%	73.66%
BSAI Total A Season	11,141	105,548	116,689
% of BSAI A Season Total	9.55%	90.45%	100.00%
BSAI Total B Season	8,812	114,310	123,122
% of BSAI B Season Total	7.16%	92.84%	100.00%

Table 5.3c

Maximum Weekly BSAI Pollock Catch Within Seasons Summed By Sector in 1993			
Sector Season	Total Discarded	Total Retained	Total Catch
Inshore A Season	2,662	26,464	29,126
% of Sector A Season Total	9.14%	90.86%	100.00%
% of BSAI A Season Total	17.96%	25.53%	24.58%
Inshore B Season	931	39,507	40,438
% of Sector B Season Total	2.30%	97.70%	100.00%
% of BSAI B Season Total	22.90%	30.25%	30.03%
Offshore A Season	12,161	77,212	89,373
% of Sector A Season Total	13.61%	86.39%	100.00%
% of BSAI A Season Total	82.04%	74.47%	75.42%
Offshore B Season	3,135	91,093	94,228
% of Sector B Season Total	3.33%	96.67%	100.00%
% of BSAI B Season Total	77.10%	69.75%	69.97%
BSAI Total A Season	14,823	103,676	118,499
% of BSAI A Season Total	12.51%	87.49%	100.00%
BSAI Total B Season	4,066	130,600	134,666
% of BSAI B Season Total	3.02%	96.98%	100.00%

Table 5.3d

Maximum Weekly BSAI Pollock Catch Within Seasons Summed By Sector in 1994			
Sector Season	Total Discarded	Total Retained	Total Catch
Inshore A Season	953	31,907	32,860
% of Sector A Season Total	2.90%	97.10%	100.00%
% of BSAI A Season Total	11.50%	23.38%	22.70%
Inshore B Season	334	36,534	36,868
% of Sector B Season Total	0.90%	99.10%	100.00%
% of BSAI B Season Total	3.78%	29.79%	28.04%
Offshore A Season	7,339	104,591	111,930
% of Sector A Season Total	6.56%	93.44%	100.00%
% of BSAI A Season Total	88.50%	76.62%	77.30%
Offshore B Season	8,501	86,103	94,604
% of Sector B Season Total	8.99%	91.01%	100.00%
% of BSAI B Season Total	96.22%	70.21%	71.96%
BSAI Total A Season	8,293	136,498	144,791
% of BSAI A Season Total	5.73%	94.27%	100.00%
BSAI Total B Season	8,834	122,637	131,471
% of BSAI B Season Total	6.72%	93.28%	100.00%

Table 5.4

Projected BSAI Pollock Catch By Season Under Alternative 1 Using 1994 Maximums			
Sector	Discarded Catch	Retained Catch	Total Catch
Inshore A Season	3,768	126,097	129,864
% of Sector Season Total	2.90%	97.10%	100.00%
% of BSAI A Season Total	11.50%	23.38%	22.70%
Inshore B Season	1,619	177,277	178,895
% of Sector Season Total	0.90%	99.10%	100.00%
% of BSAI A Season Total	3.78%	29.79%	28.04%
Inshore Closed Season	11,509	6,136	17,646
% of Sector Season Total	65.22%	34.78%	100.00%
% of BSAI Closed Season Total	25.90%	22.39%	24.56%
Inshore Sector Total	16,895	309,509	326,405
% of Sector Total	5.18%	94.82%	100.00%
% of BSAI Total	15.77%	26.34%	25.46%
Offshore A Season	29,005	413,344	442,349
% of Sector Season Total	6.56%	93.44%	100.00%
% of BSAI A Season Total	88.50%	76.62%	77.30%
Offshore B Season	41,248	417,804	459,052
% of Sector Season Total	8.99%	91.01%	100.00%
% of BSAI A Season Total	96.22%	70.21%	71.96%
Offshore Closed Season	32,928	21,275	54,203
% of Sector Season Total	60.75%	39.25%	100.00%
% of BSAI Closed Season Total	74.10%	77.61%	75.44%
Offshore Sector Total	103,181	852,423	955,604
% of Sector Total	10.80%	89.20%	100.00%
% of BSAI Total	96.30%	72.55%	74.54%
BSAI Total A Season	32,773	539,440	572,213
% of Season Total	5.73%	94.27%	100.00%
% of BSAI Total	30.59%	45.92%	44.63%
BSAI Total B Season	42,867	595,080	637,947
% of Season Total	6.72%	93.28%	100.00%
% of BSAI Total	40.01%	50.65%	49.76%
BSAI Total Closed Season	44,437	27,411	71,849
% of Season Total	61.85%	38.15%	100.00%
% of BSAI Total	41.47%	2.33%	5.60%
BSAI Total	107,143	1,174,865	1,282,009
% of BSAI Total	8.36%	91.64%	100.00%

Table 5.5a

Projection of Total Production Using 1994 Utilization Rates and Seasonal Averages			
		Total Product	Total Catch
Inshore	Tons	113,492	373,767
	Product/Total Catch (PRR)	30.36%	
Offshore	Tons	164,471	908,242
	Product/Total Catch (PRR)	18.11%	
BSAI Total	Tons	277,963	1,282,009
	Product/Total Catch (PRR)	21.68%	

Table 5.5b

Projection of Total Production Using 1994 Utilization Rates and Seasonal Maximums			
		Total Product	Total Catch
Inshore	Tons	99,111	326,405
	Product/Total Catch (PRR)	30.36%	
Offshore	Tons	173,047	955,604
	Product/Total Catch (PRR)	18.11%	
BSAI Total	Tons	272,158	1,282,009
	Product/Total Catch (PRR)	21.23%	

Table 5.6a

Projected Processed Product of BSAI Pollock by Sector Using Seasonal Averages								
		H & G	Roe	Fillets	Surimi	Minced	Meal/Oil	Total Product
Inshore	Tons	1	2,759	8,031	66,439	2,240	34,022	113,492
	% of Sector Total Product	0.00%	2.43%	7.08%	58.54%	1.97%	29.98%	40.83%
	% of BSAI Total	0.14%	27.32%	18.93%	41.52%	26.89%	60.64%	100.00%
Offshore	Tons	982	7,339	34,400	93,579	6,088	22,084	164,471
	% of Sector Total Product	0.60%	4.46%	20.92%	56.90%	3.70%	13.43%	59.17%
	% of BSAI Total	99.86%	72.68%	81.07%	58.48%	73.11%	39.36%	59.17%
BSAI Total	Tons	983	10,098	42,430	160,017	8,328	56,106	277,963
	% of Total Products	0.35%	3.63%	15.26%	57.57%	3.00%	20.18%	100.00%

Table 5.6b

Projected Gross Revenue From BSAI Pollock Using Seasonal Averages								
		H & G	Roe	Fillets	Surimi	Minced	Meal/Oil	Gross Revenue
Inshore	Gross Revenue	$ 1,055	$ 21,941,522	$ 18,325,281	$ 105,166,102	$ 1,940,365	$ 14,602,479	$ 161,976,805
	% of InshoreGr. Revenue	0.00%	13.55%	11.31%	64.93%	1.20%	9.02%	31.67%
	% of BSAI Product Gr. Rev.	0.38%	20.94%	17.62%	38.98%	26.99%	57.36%	100.00%
Offshore	Gross Revenue	$ 277,941	$ 82,819,688	$ 85,702,804	$ 164,630,165	$ 5,248,134	$ 10,856,939	$ 349,535,671
	% of OffshoreGr. Revenue	0.08%	23.69%	24.52%	47.10%	1.50%	3.11%	68.33%
	% of BSAI Product Gr. Rev.	99.62%	79.06%	82.38%	61.02%	73.01%	42.64%	68.33%
BSAI Total	Gross Revenue	$ 278,997	$ 104,761,209	$ 104,028,086	$ 269,796,267	$ 7,188,499	$ 25,459,417	$ 511,512,475
	% of BSAI Gr. Revenue	0.05%	20.48%	20.34%	52.74%	1.41%	4.98%	100.00%

Table 5.7a

Projected Processed Product of BSAI Pollock by Sector Using Seasonal Maximums							
	H & G	Roe	Fillets	Surimi	Minced	Meal/Oil	Total Product
Inshore Tons	1	2,410	7,013	58,020	1,956	29,711	99,111
% of Sector Total Product	0.00%	2.43%	7.08%	58.54%	1.97%	29.98%	36.42%
% of BSAI Total	0.12%	23.78%	16.23%	37.08%	23.39%	56.12%	100.00%
Offshore Tons	1,033	7,721	36,193	98,458	6,406	23,235	173,047
% of Sector Total Product	0.60%	4.46%	20.92%	56.90%	3.70%	13.43%	63.58%
% of BSAI Total	99.88%	76.22%	83.77%	62.92%	76.61%	43.88%	63.58%
BSAI Total Tons	1,034	10,131	43,206	156,478	8,362	52,946	272,158
% of Total Products	0.38%	3.72%	15.88%	57.50%	3.07%	19.45%	100.00%

Table 5.7b

Projected Gross Revenue From BSAI Pollock Using Seasonal Maximums							
	H & G	Roe	Fillets	Surimi	Minced	Meal/Oil	Gross Revenue
Inshore Gross Revenue	$ 922	$ 19,161,226	$ 16,003,214	$ 91,840,096	$ 1,694,494	$ 12,752,142	$ 141,452,093
% of InshoreGr. Revenue	0.00%	13.55%	11.31%	64.93%	1.20%	9.02%	27.78%
% of BSAI Product Gr. Rev.	0.31%	18.03%	15.07%	34.65%	23.48%	52.75%	100.00%
Offshore Gross Revenue	$ 292,435	$ 87,138,428	$ 90,171,889	$ 173,215,018	$ 5,521,805	$ 11,423,088	$ 367,762,662
% of OffshoreGr. Revenue	0.08%	23.69%	24.52%	47.10%	1.50%	3.11%	72.22%
% of BSAI Product Gr. Rev.	99.69%	81.97%	84.93%	65.35%	76.52%	47.25%	72.22%
BSAI Total Gross Revenue	$ 293,356	$ 106,299,654	$ 106,175,102	$ 265,055,115	$ 7,216,299	$ 24,175,230	$ 509,214,755
% of BSAI Gr. Revenue	0.06%	20.88%	20.85%	52.05%	1.42%	4.75%	100.00%

Table 5.8a

Projection of Gross Revenue per Ton of Total Catch Using Seasonal Averages				
			Total Product	Total Catch
Inshore	Gross Revenue	$	161,976,805	373,767
	Revenue/Tons	$	433.36	
Offshore	Gross Revenue	$	349,535,671	908,242
	Revenue/Tons	$	384.85	
BSAI Total	Gross Revenue	$	511,512,475	1,282,009
	Revenue/Tons	$	398.99	

Table 5.8b

Projection of Gross Revenue per Ton of Total Catch Using Seasonal Maximums				
			Total Product	Total Catch
Inshore	Gross Revenue	$	141,452,093	326,405
	Revenue/Tons	$	433.36	
Offshore	Gross Revenue	$	367,762,662	955,604
	Revenue/Tons	$	384.85	
BSAI Total	Gross Revenue	$	509,214,755	1,282,009
	Revenue/Tons	$	397.20	

5.1.4 Implications of Projected Outcomes Compared To The Base Case

The projected harvest splits result in a decline in overall gross revenues from those projected to have occurred in 1994. Overall gross revenues decline from $515.1 million to $511.5 million or $509.2 million depending on the projection methodology. These appear to be rather insignificant changes. Thus, it could be argued that implementing Alternative 1 would be a relatively neutral action in terms of changes in gross revenues.

Imbedded in projected outcomes of Alternative 1 is the assumption that inshore seasons would shorten. Shorter seasons and a more intense race for fish will likely lessen utilization rates, which in turn would decrease the gross revenues estimated above, particularly for the inshore sector which has made significant gains in this area since 1992. Shorter seasons also imply more discards and bycatch. Also implied by shorter seasons are increased costs for labor. More will be spent finding qualified workers willing to work shorter periods with more uncertainty.

In addition to the reallocation of catch to the offshore sector this alternative would also remove the CVOA and eliminate CDQ allocations. The implications of these actions are discussed elsewhere in this document in greater detail. In general, the CVOA discussion concluded that the CVOA itself is relatively neutral in terms of the fishery. The exception may be that marine mammals are provided additional protection. Conclusions from the CDQ discussion point out the successes of that program, as well as the gain in expected net benefits which are believed to result from the allocation of harvest rights to individual entities.

5.1.5 Stability Implications

Eliminate the inshore-offshore allocation by implementing Alternative 1, would appear to have negative stability implications, particularly for the inshore sector and affected communities. The uncertain levels of harvest could intensify the race for fish and decrease season lengths. Shorter seasons mean less stability as processor must find employees willing to work shorter periods. Less employment implies longer periods of unemployment for workers in the inshore sector. Increased unemployment is a significant indicator of destabilization.

The additional uncertainty caused by Alternative 1 could have other impacts. Although there is no proof that the apparent structural break in surimi prices was caused by the debate over the Inshore-Offshore Amendment, there is some evidence to lead to that conclusion. Stable prices allow processors to plan production and to shift production capacity to more profitable configurations. In an uncertain market, these plans become mere speculation. Additional discussions regarding stability gains of reauthorizing the inshore-offshore allocation are included in Chapter 6. Most if not all of the arguments presented there apply inversely under Alternative 1.

5.1.6 Overall Conclusions Regarding The Impacts of Alternative 1 on BSAI Pollock

Implementing Alternative 1 appears to have the following impacts on the BSAI pollock fishery:

1) A decrease in overall gross revenues.
2) A distributional shift from relatively higher revenues inshore to lower revenues offshore.
3) Shorter seasons resulting in an intensified "race for fish" which could reduce utilization rates and increase discards and bycatch, increase labor costs, and increase unemployment for the inshore sector.
4) Less stability particularly for the inshore sector.
5) The possibility of greater uncertainty in prices and markets.

5.2 PROJECTIONS OF THE GOA POLLOCK FISHERY UNDER ALTERNATIVE 1

Projections for the GOA pollock fishery under Alternative 1 were not feasible using the methodologies employed in the previous section. This is because the 100% allocation of the fishery to the inshore sector meant there were no data upon which to base offshore sector harvests. Therefore, we resort to "educated guesses."

Given the relative magnitude of the GOA pollock fishery compared to the BSAI pollock fishery, it appears unlikely that a significant amount of offshore effort would be directed at the GOA in the first quarter. During the second and third quarter apportionments, however, it is likely that at least some processors from the offshore sector would venture into the GOA. This is because the' 'B season for the BSAI is delayed until after these apportionments are typically fished. This is what occurred in 1991, the last year in which offshore catcher-processors were allowed to participate. Fourth quarter apportionments would likely be unaffected as these generally coincide with the larger more productive BSAI 'B' season. The implications of some offshore vessels entering the GOA pollock fishery in the second and third quarters are reduced seasons, intensified races for fish, lower utilization rates, higher discard rates and bycatch. All of these will lead to destabilizing effects for the GOA inshore sector, and the communities dependent on those processors.

Another consideration is the one-week trawl delay implemented for BSAI pollock in 1995. If the delay is continued in 1996, then there may need to be some kind of a similar delay implemented in the GOA. Otherwise, the offshore fleet would almost certainly enter the GOA in the week prior to the opening of the BSAI.

5.3 PROJECTIONS OF THE GOA PACIFIC COD FISHERY UNDER ALTERNATIVE 1

As was the case for pollock in the GOA, sufficient data necessary to quantify projections of the Pacific cod fishery in the GOA under Alternative 1 are lacking. It is possible to make some limited projections of the impacts of increased freezer longliner activity in this fishery. These are discussed in detail in Chapter 6. The conclusions made there, indicated that allowing the freezer longliner fleet access to GOA P. cod would not be beneficial to the current inshore sector. Given the longline allocation for cod in the BSAI, LP1 vessels would likely enter the GOA prior to fishing their larger guaranteed allocation in the BSAI. If the P. cod TAC increases in the GOA as expected, it is estimated that this sector of the fleet would be able to process the entire amount of that increase without giving up any catch in BSAI.

In addition to the LP1 vessels, it is also possible that some vessels in the TP2 and TP3 classes, particularly the latter, would choose to focus on Pacific cod in the GOA rather than in the BSAI. This is less certain an outcome than the entry of the LP1 fleet because of the timing of the seasons. Recall that the Pacific cod fisheries in the Gulf has typically ended around the end of March, about the same time the BSAI 'A' season for pollock end.

Overall it would appear that Alternative 1 would benefit the freezer longliner class at the possible expense of the rest of the current inshore fleet. An important caveat in all of these conclusions is the impact of the GOA pollock fishery on the GOA Pacific cod fishery. If pollock TACs are high, more effort will be expended in that fishery early in the year causing the Pacific cod season to be longer. If pollock TACs are low, then effort will shift to the Pacific cod fishery. This will be the case whether or not the Inshore-Offshore Amendments are reauthorized.

5.4 GENERAL CONCLUSIONS REGARDING ALTERNATIVE 1

There does not appear to be significant benefits to implementing Alternative 1 for any of the three fisheries in question. In the BSAI pollock fishery, the Alternative would likely lead to less stability for the inshore fleet and would not appear to increase net benefits to the Nation, given cost and price assumptions, as might have been predicted with the Supplemental Analysis. The distributional shifts would obviously benefit some sectors over others. For the GOA, it is argued that the Alternative would benefit the freezer longline fleet at the expense of the current participants in the Pacific cod fishery. In the GOA pollock fishery, offshore catcher-processors would conceivably benefit by entering the second and third quarter fisheries. This would cause shorter seasons which would be destabilizing on the current participants.

6.0 PROJECTED OUTCOMES UNDER ALTERNATIVE 2: Reauthorization of Amendment 18/23

6.1 HARVEST AND PROCESSING

With the reauthorization of Amendment 18/23, allocation percentages would be the same as they have been for the past three years —for the GOA, 100 % of the pollock and 90% of the Pacific cod would be allocated inshore; for the BSAI pollock only would be allocated 35% inshore and 65% offshore. This alternative would represent no change compared to the base case which detailed activities in the fisheries with the same inshore/offshore allocations in place. Continuation of the BSAI allocations, combined with a pending vessel moratorium (and possible license limitation program), will result in approximately the same patterns of harvesting and processing as have occurred in the past three years, except as modified by other restrictions such as PSC related closures or mandatory retention standards. Further, it is likely that the same harvesting and processing vessels would be participating in these activities.

Though the relative proportions of harvesting and processing by sector would not be expected to change, resource conditions for the two GOA fisheries are significantly different than they have been in the past two to three years. Pollock in the GOA are declining in abundance, with current 1995 TACs set approximately 35% below the average for the past three years (1995 TAC is 65,360 mt). This has been countered by a similar increase in the Pacific cod TACs for 1995. After declining from 1990 to 1994, the P. cod TAC for 1995 is back up near previous levels, at 69,200 mt.

One consideration relative to GOA pollock are the impacts to the pollock stocks themselves, and the ability of fisheries managers to effectively monitor catch rates and prevent quota overruns. The pollock quotas are divided into four, small quarterly allocations of about 15,000 mt each, further divided into three specific management areas. Alternative 2 would limit the harvest of this resource to smaller, shore based vessels with much lower catching capacities than, for example, larger factory trawl vessels. The ability to effectively monitor pollock catch, and prevent quota overruns, would be maintained and enhanced under adoption of this alternative, relative to Alternative 1.

Viability of onshore processing plants in the GOA is heavily dependent on groundfish resources, particularly pollock and P. cod. A continuation of the allocations under Amendment 18/23 would facilitate continued viability of these plants, until alternative, more comprehensive management programs are developed. The recent decreases in pollock availability are somewhat offset by increases in P. cod availability. The additional quota available in 1995 will likely extend the overall P. cod season in the GOA for an additional 4 to 5 weeks, perhaps into May. This would offer plants additional processing opportunities at a time when they have typically been idled after pollock fisheries have been completed, but before salmon season begins. The trend for P. cod in the GOA appears to be steady or slightly increasing for the next few years at least, so this availability may occur through 1998, the expected duration of the reauthorization.

If the Council chooses Alternative 2, reauthorization of the allocations, they may also consider the definitions of "inshore" and "offshore," particularly as they pertain to freezer/longliners. This decision will have direct implications for the P. cod fisheries in the GOA. A detailed discussion of this issue is contained later in this Chapter, in Section 6.5. Community impacts are discussed separately in Chapter 8.

6.2 CVOA CONSIDERATIONS

Another area which the Council has indicated may be readdressed in the reauthorization is the CVOA. Information has been requested (and presented in Chapter 3) relative to activities within the CVOA during the 1992-1994 fisheries. In the original amendment, the CVOA was included as a critical component in the overall provisions of that amendment to be applied only to the 'B' season fishery. The CVOA analysis from the 1992

Supplemental Analysis of Amendment 18/23 found that both the inshore and offshore sectors have historically relied on that area for pollock harvest, but that the inshore sector was much more dependent (90-99% of their harvest came from that area in 1989-1991). That analysis also found that average size of pollock is larger within the CVOA than outside the CVOA, which tends to increase operational costs for the sector denied access to the CVOA.

Shore based vessels rely more heavily on pollock resources close to their processing bases. Pollock must be processed rather quickly after harvest; allowing offshore vessels to fish in the CVOA could result in shore based vessels having to venture farther from their bases in order to catch their quota of fish, if the offshore vessels have fished in, and depleted, concentrations of fish in the CVOA.

The summary of CVOA activities for 1991-1994, as presented in Chapter 3, contains findings basically consistent with the projections from the original analysis. From 1990 to 1994, the overall pollock population has changed from one composed of several year classes to one composed of a dominant (1989) year class. It also shows that a shift has occurred in the areal distribution of exploitable biomass, towards the southeast in the direction of the CVOA. This phenomenon may have contributed to a fishery which harvests pollock disproportionately to its areal distribution. During the 1990-1994 'B' seasons, the harvest rates of exploitable pollock in the CVOA have been 22-50%, much higher than outside the CVOA.

If the CVOA restrictions are relaxed, allowing for example, offshore vessels to fish there in the 'B' season, this disproportionate harvest activity would likely be exacerbated due to additional effort being concentrated in the CVOA. Pollock 'A' season harvest is already concentrated in the CVOA by both sectors. The likelihood of additional offshore effort in the 'B' season is supported by the fact that overall CPUEs were lower for the offshore fleet in 1993 and 1994, compared to 1991 and 1992, partly due to attempts to avoid smaller pollock from the 1989 cohort class. Though there is variation across years from 1990 to 1993, mean length of pollock is similar both inside and outside the CVOA, though the percentage of fish > 30 cm, commercially viable size, has generally been higher inside the CVOA. The examination of CVOA catch indices indicates that the offshore sector realizes no significant impediments to its fishing operations by exclusion from the CVOA. Overall CPUEs of exploitable fish have been similar both inside and outside the CVOA, though higher operating costs may be associated with smaller average pollock. In 1993, both average size and the percentage < 30 cm was similar both inside and outside the CVOA.

The higher concentrations of fishing effort which might occur under relaxation of the CVOA may have negative impacts for marine mammals. Though marine mammals rely on smaller pollock than the commercial fishery, there is considerable overlap. Exploitation rates in the CVOA are already higher than other areas, and marine mammal critical habitat areas exist within the CVOA. Without the exclusion of offshore vessels from the CVOA 'B' season in 1993 and 1994, the disproportionate harvest rates would have likely been higher. Without the CVOA in 1996 and beyond, it is likely that the rates will also be higher.

In terms of bycatch of prohibited species, Chapter 3 information shows that bycatch rates of salmon and herring are higher inside the CVOA in August and September during which the bulk of the 'B' season fishery occurs. Additional effort in this area could result in higher overall bycatch of salmon and herring.

6.3 ECONOMIC INDICES

6.3.1 Cost-Benefit Implications

A reauthorization of Amendment 18/23 would be expected to result in the same general cost-benefit impacts as projected in the original Supplementary Analysis from 1992, as adjusted by findings from this current analysis. Wholesale, quantitative reassessment has not been conducted in this analysis, but changes in primary model parameters have been identified which may directionally affect the original findings. From Chapter 4, we saw that the expected net losses to the nation were likely overstated in the original analysis, and that changes in the actual fisheries relative to assumptions used in that analysis would tend to move the expected impacts more towards neutral. Magnitudes of that directional tendency are not quantitatively estimated.

Net cost-benefit impacts of continuing the allocations for an additional three years may still fall into the negative side of the range of possible outcomes; net gains will still accrue to the inshore sector, at the expense of losses to the offshore sector. However, given that the original analysis projected a range of expected values from $37 million loss to $11 million gain (depending on model parameters used), it is likely that the impact of an additional three-year allocation more closely approaches neutrality, in terms of net benefits to the nation.

6.3.2 Distributional Impact Considerations

The methodologies for projecting distributional changes in employment and income, at a community/regional level, are directly dependent on the revenues generated from the fisheries for each sector. The original analysis (Supplemental analysis from September 1992) predicted net losses in direct income of $20 -$28 million, depending on model parameters used, and could project a gain of $11 million using selected model parameters. In that analysis benefits to inshore sectors were more than outweighed by losses to the offshore sector. Based on information presented in Chapter 4, fish prices and product mixes have changed to the point that overall revenues from the fisheries for both sectors are significantly reduced, relative to the projections made in the original analysis . The bottom line effect of this is to dampen the magnitude of any distributional effects overall; i.e., drive them towards the zero, or neutral point, keeping in mind that distributional effects are a function of both income from fisheries and employment from fisheries.

While we have information which shows that previous projections overstated direct income effects (and therefore overstate regional economic activity overall), we have no information on, and make no assessments of, changes in employment relative to previous projections. Those previous projections indicated a substantial loss of employment for the Pacific Northwest communities, and a gain for Alaska based communities. There is no information contained in this analysis to indicate that those employment projections were inaccurate.

The reductions in direct income from the fisheries for both sectors tends to reduce the aggregate income effects when compared to the original analyses, though we still expect gains to the inshore sector and losses to the offshore sector overall, when combined with employment effects. The overall directional tendency towards neutrality is bolstered somewhat by the information in Chapter 4, which indicates slightly less of a reduction in "efficiencies" for the inshore sector than the offshore sector. Though this is complicated somewhat by the fact that inshore activity benefits both the Dutch Harbor and Pacific Northwest economies, the general effect is to provide relatively greater benefits to the communities and regions which rely on the inshore processing activities to fuel their economies. Even with this differential effect taken into account, it is likely that the total impacts on income and economic activity (distributional effects) were much closer to neutral than originally projected, and more closely approximate what would be the case under a three-year extension.

It is important to reiterate, however, that even though the trend is more towards a more neutral impact in aggregate, some distributional impacts will certainly still be expected, and any level of impacts to Alaska coastal economies are far more significant than a similar level of impacts to Pacific Northwest economies. This is a consistent finding in both the distributional analyses previously conducted and the Social Impact Assessment previously conducted. Therefore, although net negative impacts in direct income may still be expected, these impacts are reduced from projections in the original analysis. These impacts for 1996-1998, under the three year extension, would be similar to the impacts actually occurring in 1993-1995. An additional, qualitative discussion of community impacts is contained in Chapter 8.

6.4 STABILITY IMPLICATIONS

The Council's Problem Statement for the proposed reauthorization of Amendment 18/23 emphasizes the issue of stability in the fishing industry and between affected industry sectors, during an interim period of time necessary to complete the Council's CRP initiative. Partly due to the inshore/offshore allocations in place through 1995, the industry is in a different state than existed in 1991, and is in the midst of development of a comprehensive management regime which may culminate in an individual quota program which includes both the harvesting and processing sectors of the industry. Development of the CRP program began in late 1992 and has been at the forefront of every Council meeting since that time. Development has been slow and contentious, at least partially due to a dilemma over how to accommodate onshore processing operations within that program. The current focus of the CRP program is on development of an interim License Limitation program which, in and of itself, will not resolve the allocation and preemption problems associated with onshore and offshore processors.

Pending reauthorization of the Magnuson Act, coupled with further CRP development by the Council and the industry, may hold the mechanisms for permanent resolution of the problems addressed by the original Amendment 18/23, and the proposed reauthorization. A stable environment in the fisheries has been cited by the Council as critical to successful CRP development. Indeed, the disruption of existing distributions of harvesting and processing of pollock and P. cod, and the business relationships based on those distributions, could have serious and adverse implications for successful CRP development.

It is intuitively obvious that, compared to the base case (the 1993 and 1994 fisheries), continuation of the inshore/offshore allocations as they now exist would result in the least change, relative to that base case. Stability is epitomized by lack of change in a given industry or between sectors in a given industry. The existing allocations provide a reasonable assurance to each industry sector involved regarding the amount of fish for harvesting and processing. Business planning is largely affected by these allocations for both inshore and offshore processors and harvesting vessels which deliver to them. The continuation of these allocations for an additional three years would maintain the relationships between these sectors as they have developed over the past three years. The stability which has been established <u>between</u> these various industry sectors may not guarantee survival of entities within these sectors, but may be crucial to the successful fruition of the CRP program over the next three years.

One other aspect of stability which may hinge indirectly on the inshore/offshore allocations is the prices of pollock products. As we saw in Chapter 4 (Figure 4.1), prices for pollock products, particularly fillets and surimi, increased dramatically in 1991 and 1992, prior to the approval and implementation of the allocations. Once the allocations were implemented, these prices fell back to around previous levels, a dramatic decrease from the prices experienced in 1991 and 1992. To the extent that these price fluctuations were caused by uncertainty associated with the potential processing allocations, a continuation of the program would more likely smooth out these fluctuations relative to allowing the allocations to expire.

As we saw in Chapter 5, allowing the inshore/offshore allocations to expire would result in a projected "reallocation" of about 6% of the overall pollock quota in the BSAI; i.e., the split between inshore and offshore processing would be about 29/71, similar to pre-inshore offshore splits, as opposed to the current 35/65. Because of this projected change, the reauthorization of Amendment 18/23 holds implications for future tradeoffs between industry sectors. Under the reauthorization, the offshore sector would be giving up about 6% of pollock harvests/processing which it would enjoy if the allocations were allowed to expire. Conversely, the inshore sector enjoys about a 6% "gain" under the reauthorization relative to expiration of the allocations. From the offshore sector's perspective, this 6% relative loss represents a tradeoff between increased revenues and some amount of upheaval in the industry which may result if the allocations are allowed to expire. Continuation of the allocations may provide the stable operating environment necessary for eventual implementation of CRP programs such as IFQs, something the offshore sector generally has been striving towards.

The stability which will be maintained by Alternative 2—the reauthorization of Amendment 18/23—will be affected by considerations relative to the CVOA and the designation of freezer/longliners. Changes to the CVOA have the potential to affect the relationships between the inshore and offshore processing sectors and between the inshore processors and the harvesting vessels which deliver fish to them. Catch rates of pollock and the delivery schedules for pollock could be altered by allowing offshore vessels into the area during the 'B' season, or even by adjusting the boundaries of the CVOA. Overall bycatch of prohibited species such as salmon could be affected, which would in turn indirectly affect the timing and amount of deliveries for onshore vessels, and harvests and processing for offshore vessels. Whether these types of intrusions upon industry stability would have serious impacts, or would adversely affect CRP development, is not quantifiable.

The impacts of changing the definition of "inshore" relative to freezer longliners may have more direct impacts on stability, not only between inshore and offshore processors, but between harvesting sectors and the communities from which they originate. These potential impacts are detailed in the following section.

6.5 INSHORE VS OFFSHORE DESIGNATION OF FREEZER/LONGLINERS

In the original Amendment 18/23, the designation of freezer/longliners as inshore or offshore was discussed, particularly relative to the allocation of Pacific cod in the GOA. Initially the Council had designated all freezer/longliners as "inshore." This seemed counterintuitive as these vessels operated in a traditional "offshore" mode, not delivering product to inshore plants. In the final decision, the Council altered this definition such that all catcher/processors (both trawl and longline) would be designated as either onshore or offshore depending on vessel size and average production. If a vessel was less than 125' in length, and processed less than 18 mt per day, round weight equivalent, it would be classified as "inshore." The rationale for this change was that the impacts on preemption issues were based more on overall vessel capacity as opposed to gear type, and further that the smaller catcher/processors which would be fishing against the inshore quota do contribute to shore based economies, even though they may not deliver catch to onshore processing plants. Based on the information available at that time, it was estimated that two trawl and ten fixed gear catcher/processors would receive the inshore designation. Based on harvest shares by sector at that time, it was estimated that this designation would, in effect, reclassify 5% of the GOA Pacific cod from offshore to inshore.

In the following discussion, we attempt to assess (1) what has actually occurred during 1992, 1993, and 1994 with regard to Pacific cod harvest by sector, (2) what might have occurred if the original definition had been used (all freezer/longliners classified "inshore"), and (3) what might occur in 1996 and beyond if that designation is changed in the reauthorization of Amendment 23 (specific to the GOA).

6.5.1 Pacific Cod Harvest and Processing in the GOA in 1992, 1993, and 1994

Table 6.1 below describes harvest of P. cod in the GOA, by gear type and sector (inshore or offshore) for the past three years. Information for 1991 is also included as a reference point for what occurred prior to the implementation of Amendment 23.

In order to clarify how to read the table, we will walk through the information displayed for 1991: Hook and line vessels classified as "inshore" harvested 5,527 mt of cod which was 8.87% of the total harvest for the "inshore" sector that year. Inshore pot gear vessels took 16.53% and inshore trawl vessels took the remaining 74.6% of the cod which was taken by the inshore sector collectively. The information for the offshore sectors reads the same way, such that, for the offshore sector's share of the total P. cod harvest, hook and line vessels took 15.95% of that total, with the remainder taken by pot and trawl vessels.

Reading down the columns we see that, of the total harvest by hook and line gear, 71.21% was taken by inshore hook and line vessels and 28.79% was taken by offshore hook and line vessels. For pot gear, 98.43% was taken by inshore pot boats and only 1.57% by offshore pot boats. For trawl gear landings overall, 80.01% was taken by inshore trawl vessels and 19.99% by offshore trawl vessels.

Looking at the GOA total row, the table shows that 10.17% of the total P. cod harvest was by hook and line gear (regardless of sector), 13.71% was taken by pot gear, and 76.12 % by trawl gear. The total column shows that of the total of 76,317 mt taken in 1991, 81.64% was by the inshore sector and 18.36% by the offshore sector.

Table 6.1

Gulf of Alaska Pacific Cod Total Catch by Sector and Gear					
1991		Hook and Line	Pots	Trawl	Total
Inshore Sector Total		5,527	10,299	46,481	62,307
	% Sector Total	8.87%	16.53%	74.60%	100.00%
	% GOA Gear Total	71.21%	98.43%	80.01%	81.64%
Offshore Sector Total		2,234	164	11,612	14,010
	% Sector Total	15.95%	1.17%	82.88%	100.00%
	% GOA Gear Total	28.79%	1.57%	19.99%	18.36%
GOA Total		7,761	10,464	58,093	76,317
	% GOA Total	10.17%	13.71%	76.12%	100.00%
1992					
Inshore Sector Total		6,307	9,348	42,896	58,550
	% Sector Total	10.77%	15.97%	73.26%	100.00%
		40.37%	93.62%	78.99%	73.27%
Offshore Sector Total		9,316	637	11,410	21,363
	% Sector Total	43.61%	2.98%	53.41%	100.00%
	% GOA Gear Total	59.63%	6.38%	21.01%	26.73%
GOA Total		15,623	9,984	54,306	79,913
	% GOA Total	19.55%	12.49%	67.96%	100.00%
1993					
Inshore Sector Total		8,596	9,708	36,029	54,332
	% Sector Total	15.82%	17.87%	66.31%	100.00%
	% GOA Gear Total	95.83%	100.00%	95.31%	96.20%
Offshore Sector Total		374	-	1,772	2,146
	% Sector Total	17.43%	0.00%	82.57%	100.00%
	% GOA Gear Total	4.17%	0.00%	4.69%	3.80%
GOA Total		8,970	9,708	37,801	56,478
	% GOA Total	15.88%	17.19%	66.93%	100.00%
1994					
Inshore Sector Total		6,756	8,928	30,820	46,503
	% Sector Total	14.53%	19.20%	66.27%	100.00%
	% GOA Gear Total	96.80%	96.95%	96.59%	96.69%
Offshore Sector Total		223	281	1,088	1,593
	% Sector Total	14.02%	17.66%	68.32%	100.00%
	% GOA Gear Total	3.20%	3.05%	3.41%	3.31%
GOA Total		6,979	9,209	31,908	48,096
	% GOA Total	14.51%	19.15%	66.34%	100.00%

In examining these same distributions for 1992, 1993, and 1994, when the inshore/offshore allocations were in place, some primary findings are worth mentioning. The overall amount of the P. cod quota taken by the inshore sector has grown to just over 96% in both 1993 and 1994, despite the 90/10 allocation split specified in Amendment 23. This division is consistent across all three gear types. This may be partially due to the disallowance of a directed fishery by the offshore sector—NMFS has determined that the 10% reserved for this sector is insufficient to allow a directed fishery without the risk of exceeding quotas. The overall distribution of catch by gear type has changed also, with pot gear representing a larger share of the harvest over the years, up to the 19.15% shown for 1994. Hook and line gear, after an initial jump in 1992, has settled back down to 14.51% of the total in 1994, still higher than in 1991. Trawl gear share has dropped from 76.12% in 1991 to a steady level of about 66% in the last three years.

Table 6.2 below shows the GOA P. cod activities of the catcher/processors which were designated as "inshore." A total of 16 vessels make up this group which participated at a "significant" level; i.e., processed at least 0.1% of the total catch for a given year. Only 10% of the overall GOA P. cod catch was taken by "inshore" catcher/processors (ICPs) in 1993 and 1994 (10.28% and 9.57% respectively). Of the amount taken by ICPs in 1993 and 1994, hook and line operations took 90.37% and 89.43% respectively. The remainder was taken by trawl gear ICPs. A final piece of relevant information from this table is that, of the total GOA quota taken by all hook and line operations, 58% has been by hook and line vessels designated as ICPs (58.49% in 1993 and 58.95% in 1994).

Table 6.2

Gulf of Alaska Pacific Cod Total Catch by "Inshore" Catcher Processor

1991		Hook and Line	Pots	Trawl	Total
Offshore: ICP		1,516	-	14	1,529
	% Sector Total	99.11%	0.00%	0.89%	100.00%
	% GOA Gear Total	19.53%	0.00%	0.02%	2.00%
GOA Total		7,761	10,464	58,093	76,317
	% GOA Total	10.17%	13.71%	76.12%	100.00%
1992					
Offshore: ICP		5,428	-	598	6,026
	% Sector Total	90.07%	0.00%	9.93%	100.00%
	% GOA Gear Total	34.74%	0.00%	1.10%	7.54%
GOA Total		15,623	9,984	54,306	79,913
	% GOA Total	19.55%	12.49%	67.96%	100.00%
1993					
Inshore: ICP		5,247	-	559	5,806
	% Sector Total	90.37%	0.00%	9.63%	100.00%
	% GOA Gear Total	58.49%	0.00%	1.48%	10.28%
GOA Total		8,970	9,708	37,801	56,478
	% GOA Total	15.88%	17.19%	66.93%	100.00%
1994					
Inshore: ICP		4,114	4	483	4,601
	% Sector Total	89.43%	0.08%	10.49%	100.00%
	% GOA Gear Total	58.95%	0.04%	1.51%	9.57%
GOA Total		6,979	9,209	31,908	48,096
	% GOA Total	14.51%	19.15%	66.34%	100.00%

6.5.2 Effects of Changing the Freezer/Longliner Designation

It has been suggested that in the reauthorization of Amendment 18/23 that all freezer/longliners be designated as "inshore" for purposes of the allocations. This was considered and altered by the Council in the original inshore/offshore approval. Previous information in this document has shown us that about 96% of the P. cod catch in the GOA is accruing to the inshore sector, with about 10% of that total being accounted for by ICPs. Roughly 16 catcher/processors, primarily longliners, fall under this designation and fish against the inshore GOA P. cod quota.

Based on information presented earlier in Table 4.5, which describes major P. cod processors by various vessel categories, there are an additional 20 longline catcher/processors and 4 pot catcher/processors which would be able to fish against the inshore P. cod quota in the GOA if the rules were changed to allow all fixed gear catcher processors to be designated "inshore." These are essentially the LP1 and PCP vessel categories. Table 6.3 below shows the BSAI P. cod activities of these and other vessel categories for 1994.

Table 6.3

Bering Sea and Aleutian P. Cod by Gear and Selected Processing Classes in 1994					
Sector: Class		Hook and Line	Pots	Trawl	Total
Inshore (excluding ICP)		978	6,380	39,835	47,193
	% of Sector Total	2.07%	13.52%	84.41%	100.00%
	% BSAI Gear Total	1.11%	77.47%	40.36%	24.23%
ICP	ICP	15,662	177	1,979	17,819
	% of Class Total	87.90%	1.00%	11.11%	100.00%
	% BSAI Gear Total	17.82%	2.15%	2.01%	9.15%
LP1/PCP		57,397	1,555	-	58,953
	% of Class Total	97.36%	2.64%	0.00%	100.00%
	% BSAI Gear Total	65.32%	18.89%	0.00%	30.26%
TP2		2,288	-	14,284	16,573
	% of Class Total	13.81%	0.00%	86.19%	100.00%
	% BSAI Gear Total	2.60%	0.00%	14.47%	8.51%
TP3		11,544	123	25,265	36,932
	% of Class Total	31.26%	0.33%	68.41%	100.00%
	% BSAI Gear Total	13.14%	1.49%	25.60%	18.96%
Other Offshore		-	-	17,324	17,324
	% of Class Total	0.00%	0.00%	100.00%	100.00%
	% BSAI Gear Total	0.00%	0.00%	17.55%	8.89%
BSAI Total		87,869	8,236	98,688	194,793
	% BSAI Gear Total	45.11%	4.23%	50.66%	100.00%

In the BSAI P. cod fisheries, the quotas are now allocated between trawl and fixed gear (54/44), with 2% being reserved for jig gear specifically. The bottom row of this table bears out the P. cod allocations by gear type, showing that 50.66% was taken by trawl gear, 45.11% by hook and line gear (including jig gear), and 4.23% by pot gear. Of the total hook and line catch, 65.32% is by the LP1 and PCP vessels. An additional 15.74% is caught by TP2 and TP3 vessels using fixed gear. Another 17.82% is taken by ICPs. A total of 24.23% of the total BSAI P. cod catch was by inshore vessels other than catcher/processors "designated" inshore, primarily trawl vessels (84.41% of the total for the inshore sector). Of the total BSAI hook and line catch for 1994, only 1.11% was by inshore delivery hook and line vessels. The vessels of primary concern in this discussion are the

LP1 and PCP vessels, which would be allowed to fish on the GOA inshore quota if the definition of "inshore" is changes to allow all fixed gear catcher/processors to be defined as "inshore."

In an effort to assess the impacts to the GOA P. cod fisheries of allowing these vessels to fish against the inshore quota, we examined weekly catch rates of these combined vessels in the BSAI. This assessment assumes that catch rates in the GOA would be the same, which may not necessarily be the case, and that all fixed gear vessels could enter the GOA.[1] However, we have no information on catch rates of these vessels in directed GOA P. cod fisheries. The BSAI fixed-gear vessels averaged about 13.5 mt per day, collectively 2,250 mt per week in directed BSAI P. cod fisheries (2285 mt in 1993 and 2214 mt in 1994). This compares to average catch rates of 3,100 mt per week for 1993 and 1994 for "inshore" GOA vessels collectively, resulting in an approximate 3:2 catch ratio (inshore GOA:offshore BSAI).

Figures 6.1 and 6.2 show the patterns of P. cod harvests for the GOA and BSAI respectively, for 1991-1994. The GOA quota is not allocated by gear type and is typically entirely taken by the end of March each year. Given the 3:2 harvest ratio described above, adding the LP1 and PCP categories to this quota might result in about a 40% reduction in season length for the P. cod fisheries in the GOA. This assumes that catch rates in the GOA by the LP1 and PCP would be similar to their catch rates in the BSAI, and it also assumes overall quotas for the GOA would be the same as in 1994. The other impact of such a designation would be that an additional 40% of the P. cod catch from the GOA would not make it to onshore plants. With a "guaranteed" quota in the BSAI, combined with a trimester allocation, it is likely that these vessels would fish the GOA first, and then move over to the BSAI when the overall GOA P. cod fisheries are closed due to quota attainment.

As described earlier, freezer/longliners classified as ICPs take about 9% of the overall GOA P. cod quota, and about 59% of the overall longline take of P. cod. Based on catch rate information above, these percentages would be expected to increase if this class of vessels concentrated fishing effort in the GOA early in the year. This class of vessels could end up taking up to 40% of the overall GOA quota, and up to 90% of the total longline catch of P. cod in the GOA. This finding assumes that everything else in the GOA fisheries are held constant, including pollock TACs and prices. The latter assumption is important because pollock and Pacific cod appear to be substitute targets for many vessels. If pollock TACs or prices are high then many vessels will target pollock rather than Pacific cod. If pollock TACs or prices are low, then vessels will switch to the Pacific cod fishery.

A mitigating factor in this assessment is that the current quotas for P. cod in the GOA are about 35% higher than in 1994. Whether the quotas will hold at that high level beyond 1995 is uncertain, but cod stocks in the GOA do appear to be stable. This additional quota would accommodate the LP1/PCP vessels for about 9 weeks, based on the catch rates assumed above. Since the seasons currently last about 12 weeks, one could argue that these vessels would be fishing on the "additional" quota for the first nine weeks, and would not impact the existing harvesters until that point. So the season would probably last about 10-11 weeks under this scenario, or slightly less than it has in the past few years. Under this scenario, only a slight reduction in P. cod deliveries to onshore plants would be realized. If the rules are kept the same as they are currently, the increased P. cod quotas in the GOA would result in longer seasons for vessels currently in this fishery and an increase in the P. cod deliveries to onshore plants.

These findings with regard to allowing all freezer/longliners to be classified as "inshore" would be the same findings for Alternative 1—allowing Amendment 18/23 to sunset at the end of 1995. Under that scenario, these vessels would be allowed to fish against the GOA P. cod quotas, with the same expected results, except that additional trawl vessels may enter the GOA P. cod fisheries as well.

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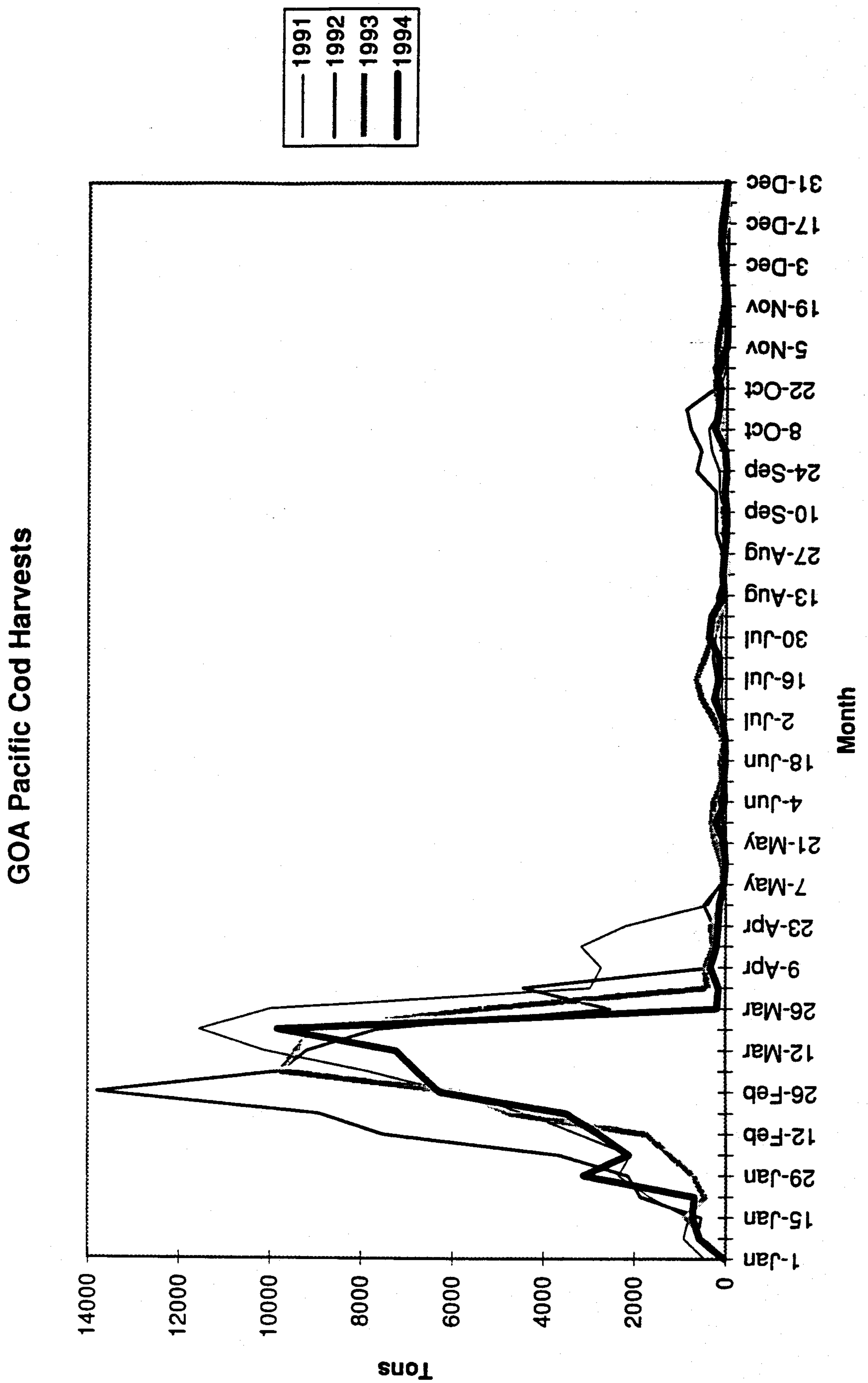
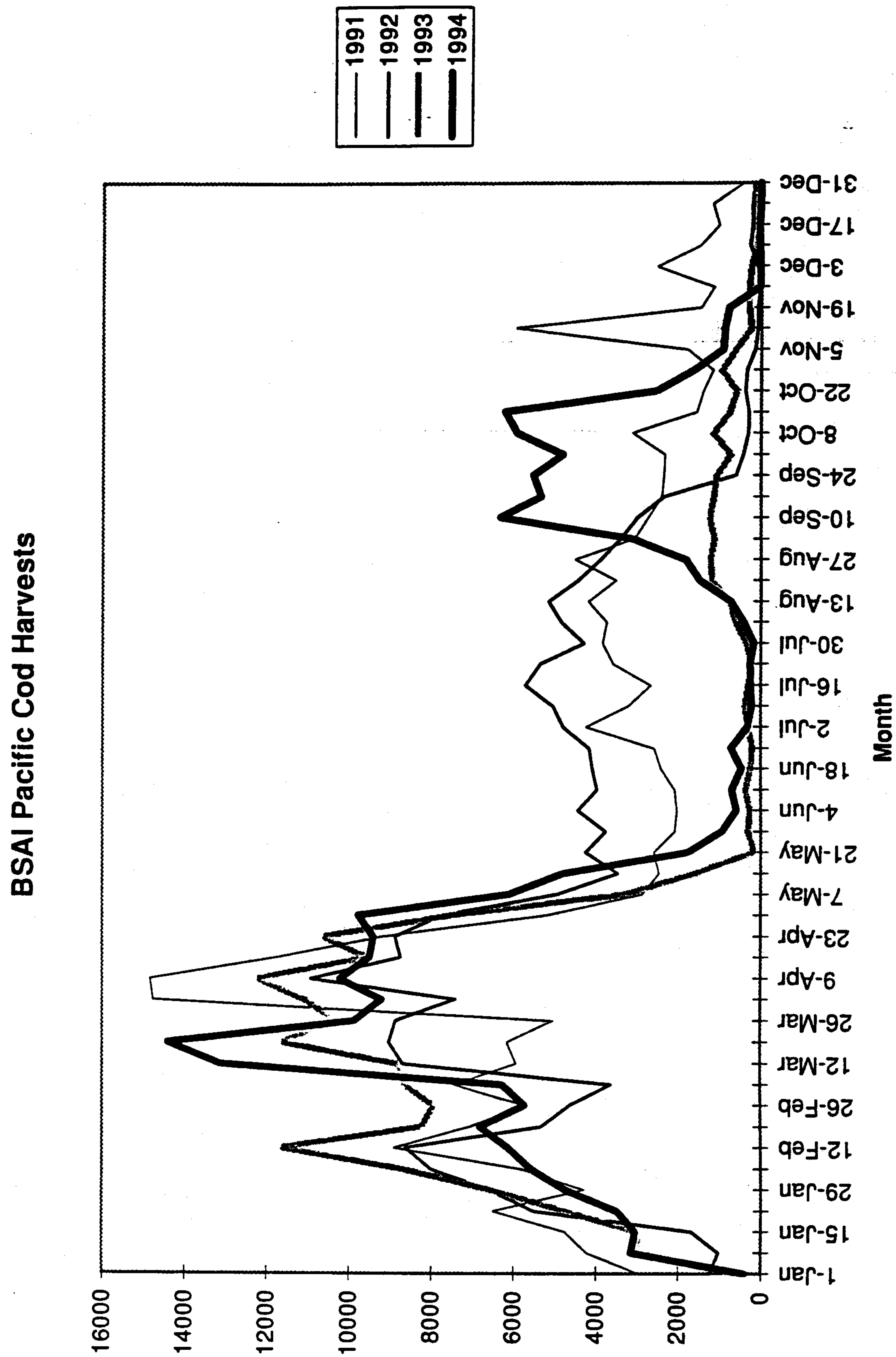
[1]We have assumed that, in allowing all fixed gear vessels to fish in the Gulf, both the 125' length restriction and the 18 mt per day limit would be dropped. The latter assumption appears to be immaterial however since the average BSAI catch rate of these vessels was found to be only 13.5 mt per day.

Figure 6.1



GOA Pacific Cod Harvests
1991
1992
1993
1994
Tons
14000
12000
10000
8000
6000
4000
2000
0
1-Jan
15-Jan
29-Jan
12-Feb
26-Feb
12-Mar
26-Mar
9-Apr
23-Apr
7-May
21-May
4-Jun
18-Jun
2-Jul
16-Jul
30-Jul
13-Aug
27-Aug
10-Sep
24-Sep
8-Oct
22-Oct
5-Nov
19-Nov
3-Dec
17-Dec
31-Dec
Month

Figure 6.2


BSAI Pacific Cod Harvests
Tons
16000
14000
12000
10000
8000
6000
4000
2000
0
1-Jan
15-Jan
29-Jan
12-Feb
26-Feb
12-Mar
26-Mar
9-Apr
23-Apr
7-May
21-May
4-Jun
18-Jun
2-Jul
16-Jul
30-Jul
13-Aug
27-Aug
10-Sep
24-Sep
8-Oct
22-Oct
5-Nov
19-Nov
3-Dec
17-Dec
31-Dec
Month
1991
1992
1993
1994

7 FINDINGS AND CONCLUSIONS

This chapter presents overall conclusions findings regarding the proposed reauthorization of Amendment 18/23 including net benefit (loss) projections, overall distributional impacts, consistency with Executive Order 12866, consistency with NEPA requirements, impacts to other fisheries, impacts to small businesses, and ability to address the Council's current Problem Statement relative to the inshore-offshore allocations. Community Impacts are discussed separately in Chapter 8, and the pollock CDQ program is discussed separately in Chapter 9.

7.1 COST-BENEFIT IMPACTS

Original cost-benefit assessments for the BSAI pollock allocations projected net losses to the nation of $37 million (expected value from Supplemental Analysis of Amendment 18 dated September 1992) from the Council's Preferred Alternative. The final percentages were adjusted to a 35/65 split (inshore-offshore), slightly different than the Council's Preferred Alternative, and were expected to slightly reduce overall net losses. The range of expected values was wide and ranged from $37 million in net losses to $11 million in net benefits, depending on the parameters chosen for the modeling exercise. Findings from this analysis indicate that the expected net loss of $37 million was likely overstated, primarily due to higher product utilization rates and a differential price reduction favoring the inshore sector.

Actual net losses to the nation due to the allocations in 1993 through 1995 were likely considerably less than originally estimated, though the exact magnitude of the difference is not quantified. Continuation of the allocations for an additional three years would likely result in similar impacts; i.e., impacts may still be an overall net loss for the three year continuation when compared to the no allocation case, but likely much less of a net loss than the $37 million estimated in the original analysis. Relative to the base case (the 1993 and 1994 fisheries), the continuation (Alternative 2) represents no change or impact. These conclusions are based on an assumption of constant costs to produce a given ton of product by each sector, and several findings including:

(1) Higher utilization rates for the inshore sector than were assumed in the original study,
(2) Lower utilization rates for the offshore sector than were assumed in the original study,
(3) Greater declines in offshore surimi prices than inshore surimi prices, coupled with relatively more offshore surimi production v. fillets and roe, than for the inshore sector, all of which results in relatively higher revenues for the inshore sector than for the offshore sector, particularly when compared to the original study, based on 1993 product prices, and
(4) A relatively greater increase in inshore capacity v. offshore capacity as measured by average and maximum weekly production.

Conversely, allowing Amendment 18/23 to expire (Alternative 1) will result in changes relative to the base case. Chapter 5 analyses estimate that the percentage split between inshore and offshore sectors would revert to a 29/71 split which is higher than levels in 1991 — pre-inshore-offshore — which were about 26.5/73.5. If we assume that the current 35/65 allocations are resulting in some amount of net loss to the nation, then expiration of the allocations would be expected to mitigate those losses. This relative net benefit (likely minimal under current estimates) would have to weighed against other factors, including distributional impacts, community impacts, and stability in the fisheries and fisheries management process over the next three years while development of the CRP initiative continues.

7.2 DISTRIBUTIONAL IMPACTS

Distributional impacts are measured as a function of income and employment at community/regional levels. Allocations of fish and fish processing affect the flow of moneys through various communities associated with the fishing industry. The original analysis for Amendment 18/23 projected losses in employment and income for Pacific Northwest regions, offset by gains in employment and income to Alaska regions. Overall direct income in aggregate was expected to be negative for the allocations under Amendment 18/23 (from a $28 million net loss to an $11 million gain, depending on model parameters chosen. Hindcasts regarding employment impacts were not attempted in the current analysis; it is expected that the findings from the original analysis with regard to employment impacts were reasonably accurate. Actual impacts to income, and therefore overall distributional impacts, are expected to be different than originally predicted.

Primarily because of dramatically reduced fish prices, direct income from fish harvesting and processing activities will be reduced from previous estimates for both sectors. In aggregate the total direct income effects are expected to be less under reauthorization of Amendment 18/23 than were estimated for the first three years of the allocations; i.e., more towards the neutral point, though perhaps still negative in aggregate. Alternative 1 would allow the inshore-offshore allocations to expire, thereby redistributing employment and income in favor of the offshore sector, relative to the base case, defined as the fisheries from 1993-1995. Impacts of this redistribution would likely be minimal overall (a 6% redistribution of processing activity is expected), but may impact the inshore sector disproportionately. This is because of the relatively greater importance of a given level of income and employment to Alaska regional economies compared to regional economies of the Pacific Northwest. In other words, relative to the base case, the redistributions expected if the allocations expired would result in positive effects to the offshore based economies, which would likely be more than offset by negative impacts to onshore based economies.

7.3 E.O. 12866 FINDINGS

Executive Order 12866 requires economic evaluation of proposed management actions, recognizing that some costs and benefits associated with proposed actions are unquantifiable. Though E.O. 12866 requires quantitative cost-benefit assessments, it places relatively more emphasis on non-quantifiable aspects of proposed regulations when compared to previous E.O. 12291. Quoting from E.O. 12866, . . . "costs and benefits shall be understood to include both quantifiable measures (to the fullest extent that these can be usefully estimated) and qualitative measures of costs and benefits that are difficult to quantify, but nevertheless essential to consider. Further, in choosing among alternative regulatory approaches, agencies should select those approaches that maximize net benefits (including potential economic, environmental, public health and safety, and other advantages; distributive impacts; and equity) . . . "

A complete reassessment of the economic impacts of the inshore-offshore allocations is not attempted in the current analysis; rather, the document relies on earlier economic impact assessments, as modified by current information and hindcasts to estimate actual impacts for the years 1993 to 1995. Major indices which might affect previous projections are identified (such as fish prices for each sector) and the current analysis identifies the likely directional impacts to the previous analyses. These are discussed above in Section 7.1 and in various other sections of the document. Previous estimates of a $37 million loss to the nation for the Council's Preferred Alternative, over the three-year life of the allocation, are likely overstated based on the current analysis. Neither alternative under consideration, extending the allocations for an additional three years or allowing them to expire, would impact the nation's economy more than $100 million annually, nor would they trigger any other provisions of the Order which would invoke a finding of "economic significance."

Consistent with E.O. 12866, the Council should consider these net benefit implications, as well as other less quantifiable aspects of the proposed action including the distributive impacts, community impacts, and overall industry stability in the context of CRP development.

7.4 CONSISTENCY WITH THE PROBLEM STATEMENT

The Council's Problem Statement for the proposed reauthorization of Amendment 18/23 emphasizes the issue of stability in the fishing industry and between affected industry sectors, during an interim period of time necessary to complete the Council's CRP initiative. Partly due to the inshore-offshore allocations in place through 1995, the industry is in a different state than existed in 1991, and is in the midst of development of a comprehensive management regime which may culminate in an individual quota program which includes both the harvesting and processing sectors of the industry. Development of the CRP program began in late 1992 and has been at the forefront of every Council meeting since that time. Development has been slow and contentious, at least partially due to a dilemma over how to accommodate onshore processing operations within that program. The current focus of the CRP program is on development of an interim License Limitation program which, in and of itself, will not resolve the allocation and preemption problems associated with onshore and offshore processors.

Pending reauthorization of the Magnuson Act, coupled with further CRP development by the Council and the industry, may hold the mechanisms for permanent resolution of the problems addressed by the original Amendment 18/23, and the proposed reauthorization. A stable environment in the fisheries has been cited by the Council as critical to successful CRP development. Indeed, the disruption of existing distributions of harvesting and processing of pollock and P. cod, and the business relationships based on those distributions, could have serious and adverse implications for successful CRP development.

It is intuitively obvious that, compared to the base case (the 1993 and 1994 fisheries), continuation of the inshore-offshore allocations as they now exist (Alternative 2) would result in the least change, relative to that base case. Stability is epitomized by lack of change in a given industry or between sectors in a given industry. The existing allocations provide a reasonable assurance to each industry sector involved regarding the amount of fish for harvesting and processing. Business planning is largely affected by these allocations for both inshore and offshore processors and harvesting vessels which deliver to them. The continuation of these allocations for an additional three years would maintain the relationships between these sectors as they have developed over the past three years. The stability which has been established <u>between</u> these various industry sectors may not guarantee survival of entities within these sectors, but may be crucial to the successful fruition of the CRP program over the next three years.

As we saw in Chapter 5, allowing the inshore-offshore allocations to expire would result in a projected "reallocation" of about 6% of the overall pollock quota in the BSAI; i.e., the split between inshore and offshore processing would be about 29/71, similar to pre-inshore offshore splits, as opposed to the current 35/65. Because of this projected change, the reauthorization of Amendment 18/23 holds implications for future tradeoffs between industry sectors. Under the reauthorization, the offshore sector would be giving up about 6% of pollock harvests/processing which it would enjoy if the allocations were allowed to expire. Conversely, the inshore sector enjoys about a 6% "gain" under the reauthorization relative to expiration of the allocations. From the offshore sector's perspective, this 6% relative loss represents a tradeoff between increased revenues and some amount of upheaval in the industry which may result if the allocations are allowed to expire.

Projections are not quantitatively performed for the GOA fisheries, but the impacts to the GOA pollock and P. cod fisheries would be expected to be relatively greater than in the BSAI, if the allocations are allowed to expire. The relatively much smaller quotas in the GOA have the inherent ability to be more dramatically affected without the protection provided by Amendment 18/23. The current allocations provide some level of stability for the harvesting and processing sectors in both areas. Current operating and business relationships which rely on that stability would likely be compromised if the allocations were allowed to expire. In the context of overall CRP development, the reversal to pre-inshore-offshore conditions may be particularly troublesome. Continuation of the allocations (Alternative 2) may provide the stable operating environment necessary for eventual implementation of CRP programs, such as IFQs, something the offshore sector generally has been striving towards.

7.5 ENVIRONMENTAL ASSESSMENT (NEPA)

The original SEIS prepared for Amendment 18/23 addressed overall biological impacts, impacts to the human environment, and marine mammal implications of the proposed actions. The action currently contemplated is a continuation of Amendment 18/23 for a specified time period. Potential impacts relative to NEPA are expected to be consistent with those previously predicted. Nothing in the examination of 1993 and 1994 fisheries leads the analysts to any differing conclusions, with respect to environmental impacts. Total removals of the pollock and cod resources are controlled by the setting of total allowable catches (TAC), and their monitoring has been enhanced recently to guard against overruns. Allocations between industry sectors will not change total removals from the stocks, and may provide an extra margin of safety against overruns by further partitioning the TACs.

Prohibited species catch (PSC) such as crab, herring, and halibut are controlled as necessary and appropriate by extensive management measures in the BSAI and in the GOA, including closed areas, PSC quotas, bycatch disincentive programs, and authorizations to the NMFS Regional Director to limit bycatch and close areas. Measures to control the bycatch of salmon have also been implemented by the Council since approval of Amendment 18/23. None of the alternatives is anticipated to change PSC or biological impacts on bycatch species, though there may be changes in fishing patterns that will need to be monitored by the Council.

Marine mammals have direct and indirect interactions with commercial fisheries. Direct interactions include shooting, harassment, disturbance, and entanglement in fishing gear or gear debris. Indirect effects include commercial fisheries related reductions in prey species for marine mammals. None of the alternatives are expected to measurably increase the direct impacts on marine mammals. Though the Council decision to allocate pollock and Pacific cod between inshore and offshore users could increase vessel traffic to and around coastal communities, the Council and NMFS have established protective buffer zones around major sea lion rookeries and walrus haul outs to minimize disturbance. Shooting and harassment also are banned. Should future problems be identified, establishment of traffic lanes or other measures could be implemented to reduce these interactions. Further, evidence from Chapter 3 of this analysis suggests that the creation of the CVOA, which excluded offshore processing vessels from the area, likely suppressed harvest rates and total removals of pollock from critical habitat areas, compared to what would have occurred in the absence of the CVOA.

Trophic interactions and the potential for fisheries to degrade the prey available to marine mammals are currently issues of great concern. There are no data available that give conclusive evidence that the pollock fisheries are negatively impacting sea lion populations. Studies of sea lion pups in 1991 show that they generally appear healthy and without signs of anemia or malnutrition. None of the proposed solutions to the inshore-offshore preemption problem will change how harvest quotas are set for the pollock resource. The quotas will continue to be set taking into account a variety of factors including the potential for impacts on marine mammal populations. These considerations, used in combination with existing restrictions on fishing operations such as buffer zones and restrictions on the amount of pollock that may be taken by quarter and area, will provide protection for sea lion populations. Section 7 consultations by NMFS during consideration of the original Amendments 18/23 or Amendments 38/40 concluded that the groundfish fisheries are unlikely to jeopardize the continued existence and recovery of any endangered or threatened species under the jurisdiction of NMFS.

The spectacled eider was listed as threatened under the Endangered Species Act (ESA) on May 10, 1993 (58 FR 27474). Breeding populations have declined steadily in Alaska, to a current maximum estimate of 3,000 pairs on the Yukon-Kuskokwim Delta compared with as many as 70,000 pairs 20 years ago. This eider is rarely seen in U.S. waters. Its marine range is not known, but it is known to molt in northeast Norton Sound (August-September) and, later, migrate west to St. Lawrence Island and there is some evidence that they winter near the pack ice in the northern Bering Sea. In February 1995, congregations of spectacled eiders were observed in openings deep in the pack ice near St. Matthew Island. The lack of observations from open waters suggests that the pack ice is their preferred wintering area. These sea ducks feed on benthic mollusks and crustaceans taken in shallow marine waters or on pelagic crustaceans.

Current knowledge indicates the GOA and BSAI groundfish fisheries are outside the normal marine range of spectacled eiders. Based on the apparent distance between principal spectacled eider range and these fisheries, the U. S. Fish and Wildlife Service (USFWS) concluded that the 1993 TACs were unlikely to adversely affect this threatened species. However, the USFWS has hypothesized that the spectacled eider may be subject to increased predation from gulls, whose populations expand in relation to fish-processing wastes; the growing gull populations might move into eider nesting areas and prey on chicks. It is not yet known whether gull populations expand through immigration or increased reproduction, but in either case heavy inshore allocations of pollock could exacerbate this problem. More information on the dispersal of gull populations is necessary to determine possible links between predation of nestlings on the Y-K Delta and waste disposal by inshore fish processors.

During the Council discussions of reauthorizing the provisions of amendments 18 and 23, members of the public expressed concern that continuation of those provisions might lead to continued or increased degradation of the marine environment of Unalaska Bay (Dutch Harbor, AK, area) from fish processing wastes disposed into the bay. Although past and current disposal of fish processing wastes into Unalaska Bay have considerably degraded some local benthic environments, those discharges are controlled under permits issued and monitored by the U.S. Environmental Protection Agency (Environmental Protection Agency, 1995).

According to a letter to the Council from the Alaska Department of Environmental Conservation [Burden, 1995], there has been confusion about the listing of South Unalaska and Akutan Bays as "impaired" water bodies. The DEC states that these water bodies have been listed as such for several years, but that agencies and processors have been working through the permitting process and a management regime known as "Total Maximum Daily Load" (TMDL), to control discharges and manage effluents into these water bodies.

The TMDL process, according to the Environmental Protection Agency [Harper, 1995], sets limits on the amount of "pollutants" that may be discharged on any given day by individual processors. If these TMDLs are not exceeded, then the agencies believe the water bodies will maintain or improve their levels of quality. The EPA noted that the overall amount of fish or shellfish coming into a facility was not the issue so much as the amount discharged on a daily basis. Further they stated that the TMDL standards are currently under review and that the EPA hopes to impose new standards by October 1995.

The amount of waste disposed into the marine environment (of Unalaska Bay and other marine areas receiving fish processing wastes) and the impacts of those discharges are not entirely dependent on the percentages of the walleye pollock and Pacific cod harvests allocated to the inshore processing component authorized by amendments 38 and 40. Instead, they are related to the amount of fish (of all species) processed, the amount of processing waste that must be disposed of, how much of the total that will be disposed of in the marine environment, and the way it is disposed of in the marine environment. The same is true for the overboard disposal of harvest discards and fish processing wastes from vessels in the offshore component. Given the above comments from State and Federal authorities, and noting the basic conclusion of Chapter 5, i.e. the amount of fish processed daily is not expected to change regardless of the Inshore/Offshore allocation, it is unlikely that reauthorization of these amendments will have a negative impact on the water quality in these areas.

NMFS reviewed the EA/RIR/IRFA under the requirements of the National Environmental Policy Act and found that none of the alternatives is expected to cause significant environmental problems or impacts to the human environment. For these reasons, a finding of <u>No Significant Impacts</u> is issued relative to the alternatives under consideration.

________________________________ ________________________

Assistant Administrator for Fisheries Date

7.6 FISHERIES IMPACT STATEMENT

The original analysis stated that it was unclear as to what effects the inshore-offshore alternatives may have on fisheries conducted off the west coast of the United States. In 1991, elements of the Alaskan offshore fleet participated for the first significant time in the Pacific whiting fishery. In anticipation of the phase-out of the joint venture fisheries and the increased growth in the offshore domestic fleet, the Pacific Fishery Management Council has allocated the whiting TAC to harvest vessel categories, and indirectly to affiliated inshore and offshore processors. How the specific allocation of pollock or Pacific cod to inshore and offshore industry sectors in Alaska has further affected the Pacific whiting fishery or other fisheries along the west coast is unknown. Socioeconomic information reported in the original analysis suggests that any impacts would be minor, as the fleet for the most part is "inshore" dependent (and secondary processing facilities can take delivery from either inshore or offshore segments), but offshore displacement from "Alaskan" fisheries to "Pacific Northwest" fisheries may affect those "inshore" fishermen that fish both areas.

In the current context of the issue —whether to extend the allocations for an additional three years— impacts may be more easily defined, since fisheries off both Alaska and the Pacific Northwest have been "closed" to further participation by a variety of regulations. The fisheries in the Pacific Northwest, at least relative to vessels which fish in both that area and off Alaska, are under a limited entry program. The fisheries off Alaska are subject to a pending vessel moratorium, to be followed by a License Limitation program and possible IFQs further down the line. Also important to consider is that, relative to the current situation, the reauthorization of Amendment 18/23 would result in little or no impacts to the participants, as it would not alter what has been in place for the last three years.

In summary, reauthorization of Amendment 18/23 is not anticipated to have any adverse effects on fisheries participants in these or adjacent fisheries, relative to the current "base case" of the fisheries. This is particularly true given the context of other, overriding allocative and limited entry management programs in fisheries off both coasts.

7.7 IMPACTS ON SMALL ENTITIES (REGULATORY FLEXIBILITY ACT)

The Regulatory Flexibility Act requires an examination of the impacts of proposed actions on small businesses, small organizations, and small jurisdictions to determine whether a substantial number of these small entities will be significantly impacted by the proposed management measures. When a Council determines that the proposal will have a significant impact on a substantial number of small entities, it must prepare an initial regulatory flexibility analysis (IRFA) to be provided to the Small Business Administration and the public for review and comment. Through the analyses presented in this document, the Council has determined that the proposed action of reauthorizing the provisions of amendments 18 and 23 will have a significant impact on a substantial number of small entities. The following paragraphs summarize those impacts. Thus under 5 U.S.C., §§ 603 and 605, this section--with the rest of this document incorporated by reference--comprises the Initial Regulatory Flexibility Analysis.

In general, fishing vessels and many processing operations are considered (under NMFS guidelines) to be small businesses. A total of about 1,700 vessels fished for groundfish off Alaska in 1993, and a similar number in 1994. Many of the vessels fall into the inshore and offshore processing components defined by the Council for the pollock and Pacific cod fisheries. Further, most of the businesses involved in the support service industry (e.g., equipment, supplies, fuel, groceries, entertainment, transportation) are considered to be small businesses (basically, a small business is any business with an annual gross revenue of not more than $2 million; 13 CFR part 121).

In addition, many small jurisdictions (any government of a district with a populations of less than 50,000 people) of Western and Southwestern Alaska will feel the impacts of the inshore-offshore allocations and the CDQ program. However, few, if any, small organizations (any not-for-profit enterprise that is independently owned and operated and not dominant in its field) will be involved with either aspect.

This analysis indicated that specific allocations to the inshore and offshore components could benefit small harvesting and processing operations associated with the one component and, conversely, negatively impact small operations associated with the other component. The magnitudes of the impacts are related to the sizes of the allocations. The continuation of specific allocations to the inshore component as well as the specific allocations of pollock to the CDQ program will continue direct benefits to many small jurisdictions of Southwest and Western Alaska. The support industry benefits directly from the economic activity in both the inshore and offshore sector. Probably, the loss in revenue associated with one component will be offset by gains obtained from the other. Overall, this proposal will impact more than 20 percent of those small entities, and NMFS considers that amount to be a "substantial number."

The reporting, record keeping, and other compliance requirements are specified in the regulations implementing amendment 38 of the BSAI FMP and amendment 40 of the GOA FMP in 50 C.F.R. Parts 672 and 675, particularly at §§ 672.4, 672.5, 675.4, 675.5, and 675.27, which are governed by OMB Control Numbers 0648-0206 and 0648-0213. In summary, for the inshore-offshore issue, the owners of processing vessels must declare on their applications for Federal permits whether they are part of the inshore component or offshore component. For the CDQ program, regulations require applying for permits, providing annual progress reports, budget reports, and budget reconciliation reports, and providing appropriate information for amending a CDQ plan.

The Council and NMFS found no relevant Federal rule that might duplicate, overlap, or conflict with the proposed rule to implement amendments 38 and 40.

The Council and NMFS found no alternative to the proposed action that would accomplish the stated objectives and that, consistent with the Magnuson Act, would reduce further any significant adverse economic impacts on small entities. Details on the alternatives and the analyses of the alternatives are contained elsewhere in this document and in the previously cited documents related to amendments 18 and 23.

8 COMMUNITY IMPACTS

The social impact assessment (SIA) prepared for Amendment 18/23 profiled six study communities (Kodiak, Sand Point, St. Paul, Unalaska, Bellingham, and Newport) in relation to their participation in the Alaska groundfish fisheries. The social impact assessment included in the SEIS contained detailed community profiles.[1] The SIA appraised the social and economic effects that the Council's specified allocative alternatives would have upon these communities. In addition to the initial six communities, a limited analysis of fisheries related issues in Ballard/Seattle was included as an addendum to the SIA.

The current analysis does not attempt a reexamination of community impacts attributable to a possible reauthorization of Amendment 18/23; rather, this EA/RIR will rely on the baseline studies previously conducted, updated by any new information which will contribute to describing the current status of these communities in the fisheries, relevant to the inshore-offshore allocation. A full scale reexamination is expected to produce results which would not differ significantly, if at all, from the previous analyses. The goal of an SIA, according to NMFS operational guidelines, is to answer such basic questions as: (1) who will be affected; (2) what will happen to the people affected; and (3) what social changes will occur under each proposed management alternative. In other words, the SIA should answer the question: How will each of the proposed changes affect the social fabric and stability of the fishery and fishing communities? This analysis provides a review of and update to the original SIA.

Review of BSAI Findings from Original SIA

The SIA concluded that the smaller Alaska communities, which are the communities most fundamentally dependent on the groundfish fishery, exhibited the most variability and greatest vulnerability to socially disruptive forces. Evidence of the vulnerability of coastal communities was demonstrated by the social and economic impacts of preemption created when offshore catcher-processors moved into the Gulf of Alaska unexpectedly in March of 1989. Groundfish processors claim that their plant capacities were being under-utilized due to the unavailability of fish. In 1989, the plants processed pollock only 90-95 days. All the communities will be negatively affected by a continuation of the olympic system *status quo*, and all would benefit (to varying degrees) from an inshore allocation.

The different options that were considered within the inshore-offshore allocation also produced different outcomes in each study community, but the differences were not precise enough to draw direct comparisons between them. In other words, the benefits or losses to one community could not be directly compared to benefits or losses in another community. According to the study, the most extreme inshore allocations provide the greatest benefit for the Alaska coastal communities and afford them the greatest chance for development and growth. The study also noted that, while an inshore allocation would clearly benefit the Alaska coastal communities at least in the short-term, such an allocation would not guarantee community stability in the long-term, as the plan does not provide protection from continuing competition within industry sectors, stock reductions, price fluctuations, or other non-allocation factors. It is far easier to accurately predict short-term social consequences in these communities than long-term consequences.

The SIA stated that the Alaska communities were judged to be able to absorb the potential social disruptions associated with the increased growth the allocation alternatives may bring, although such changes will impose social costs. Regarding the Pacific Northwest communities, the SIA concluded that the tradeoffs that would result from the allocations would be located mostly in Ballard/Seattle, and were judged to be well within the limits of change that can be handled by the economic/social structures of that community.

[1] The SIA was conducted by Impact Assessments, Inc., of La Jolla, California. In-depth community profiles of the six study communities were developed as a part of the SIA, and included as a supplementary report by the contractors. Copies of the complete community demographic profiles—as summarized in the SIS—are available from the Council office in Anchorage.

Because the scope of the SIA was limited to those towns included in the community profiles document, namely communities with ties to the shore-based trawler fleet, the Council received criticism that the SIA was more of a benefits study, rather than an assessment that could be used to weigh community benefits in Alaska against employment losses in the Pacific Northwest. This was particularly difficult to reconcile given that an inshore allocation produces impacts in both Unalaska and in the Bellingham/Seattle area.

Examining the SIA's conclusions for the individual communities affected by a BSAI allocation of pollock, Unalaska clearly benefits both economically and socially from an inshore allocation. Generally, the Unalaska/Dutch Harbor community economy derives net gains in employment and income from inshore allocations, as estimated in Section 3. Such generalizations, however, likely overlook the transactions costs and social impacts created by the respective changes to the two respective inshore and offshore sectors.

The SIA also suggests that Unalaska is likely to be destabilized by the continuance of the status quo. Without an inshore allocation, Unalaska will certainly remain a viable community, but it is likely that some inshore processors will go out of business and many will certainly operate seasonally resulting in economic downturn, an increase in transient labor, and social "marginalization." The community would continue to receive some economic benefit from offshore fishing activity.

St. Paul, as a community explicitly in need of the development of a local sustainable economy, is representative of many communities in Western Alaska. With a small resident fleet, few shore based processing facilities and little or no competitive history in the groundfish fisheries, St. Paul faces unique obstacles in developing the inherent fishery development potential of its area. However, if St. Paul and other disadvantaged communities are ever to have a place in the groundfish fishery, some form of inshore allocation, and/or a CDQ allotment, may be necessary.

Review of GOA Findings from Original SIA

The GOA communities of Kodiak and Sand Point were addressed in the original SIA compiled in 1991. The SIA found that Kodiak was particularly dependent on the fisheries in the GOA, from both the harvesting and processing perspective. The study also indicated that Kodiak was "in the enviable position that it has both the harvesting and processing capacity to handle the full GOA pollock and Pacific cod allocations." This is likely still the case, even though Pacific cod quotas in the GOA are considerably higher currently than when this study was compiled. The study also indicated that, although there are temporary workers hired from outside during the summer months, most of the processing plant employees in Kodiak are local residents. Though perhaps greater than in other, western Alaska communities, there is little alternative employment for many of these plant workers in Kodiak. Fish processing has accounted for 10 - 40% of the overall industrial payroll for Kodiak residents since 1980, with the majority of other residents engaged in fish harvesting or fisheries support activities.

Similar to Kodiak, the community of Sand Point has an economic base primarily dependent on fisheries, with the fishing industry accounting for 87% of the employment in 1987. Of the total employment, fish processing accounts for 35%. Sand Point is located within the Aleutians East Borough, which has generally benefitted from commercial fishing operations; for example, there were approximately $140 million worth of fish processed or sold within the borough boundaries in 1989. At least one plant in Sand Point has heavily invested in codfish processing capability, while there is generally less emphasis on pollock in this area. As with similar communities on the Alaskan coastline, alternative employment opportunities are scarce or non-existent.

Summary of Original Findings

Ballard/Seattle was the only community of those studied that would be negatively impacted in any significant way by an inshore-offshore allocation, according to the SIA. Part of this effect will result directly from the reduced activity of the factory trawler fleet. Much of the negative impact would be less direct, however, and would occur in the support sector and non-fishing related areas. The PNW experiences direct losses in income and employment as a result of the proposed allocations, partially offset by the gain to Alaska communities. The loss in the PNW could be expected to occur over time rather than all at once. The positive effects of an inshore allocation to the Alaska communities will be immediate and direct; the negative effects of such an action to the Pacific Northwest would be less immediate and less direct. In addition, the SIA noted that the continuation of the status quo would have immediate and direct negative consequences for economic development and social stability in the Alaska communities, while having very little positive impact on economic development or social stability in the Pacific Northwest. This summarizes the salient findings of the original SIA.

Factors Influencing the Current Base Case

Ideally these communities, as well as perhaps others, would be re-evaluated with more updated information on demographics, employment, and fisheries infrastructures currently in place. This would provide the ideal reference point for comparison of the current alternatives—either reauthorize the inshore-offshore allocation or not. Undoubtedly many subtle changes have taken place in the four years since the initial study was developed. These might include shifts in the focus of various shore side processing plants (more or less focus on groundfish vs salmon, for example), as well as shifts in the primary processing focus of the offshore, Seattle-based fleet, though the latter is less likely. Other industries or alternative employment opportunities may exist today in some of these areas which were not in existence in 1991. This, again, is more likely for the Seattle/Ballard area than for any of the Alaskan coastal communities examined. Additionally, any such changes in the Seattle/Ballard area would have a relatively minor effect when compared to a similar change in one of the other study communities, based on the findings from the original SIA.

Any shift of this nature would likely affect the results of the previous analyses only incrementally, and would not alter the general findings of the previous analyses, unless there were a major change in a particular communities infrastructure or economic base. Therefore, no attempt has been made to reassess the details as presented in the earlier SIA. If it is assumed that these communities are *basically* unchanged from 1991, in terms of their dependence on fisheries and fish processing, then the same conclusions would hold true now as are summarized in the previous section. We did attempt to identify whether there have been any significant changes which might effect overall conclusions previously offered.

Examples of some of the more major developments which have been identified include:

- A Westward Seafoods onshore processing plant in Dutch Harbor which became operational in 1992
- A major hotel, the Grand Aleutian which opened in 1993
- An airport runway extension in Unalaska in 1992
- Expansion of support services through a large-scale expansion and upgrade of the Ballyhoo Dock
- Ongoing design and construction of the Icy Creek Dam in Unalaska
- King Cove Harbor expansions in 1992 and 1993
- King Cove hydroelectric project 1992-1994
- Sand Point airport expansion and resurfacing
- Upgrade of sewer and wastewater treatment plant in Sand Point (planned)
- St. Paul airport land acquisition - 1992
- St. Paul Harbor construction in 1993
- St. Paul Harbor improvements and water systems development (under construction)
- St. Paul airport improvements (design phase)
- St. Paul landfill and incinerator (design phase)

These examples represent some of the major infrastructure developments which have occurred since 1991. Not all are directly related to fisheries or fish processing, but all would effect the impacts of a given dollar of economic activity generated by fishing or processing operations in the area. As we described in the input/output income analyses previously, the measure of a given amount of economic infusion is directly and indirectly affected by the existing infrastructures in that community. The same input/output analyses showed that the extent to which that dollar cycles through a community is at least partially a function of surrounding infrastructures, and that the impact of a given unit of economic activity is orders of magnitudes greater for the Alaskan coastal communities studied compared to the Seattle/Ballard region.

Citing again from the original analyses, the SIA analysis concluded that the continuation of status quo (in 1991) would have immediate and direct negative consequences for economic development and social stability in the Alaska communities, while having very little positive impact on economic development or social stability in the Pacific Northwest. In the context of the decision facing the Council in 1995, it would appear that a reversal to the open access fishery (allowing the inshore-offshore allocation to expire) would have at least the impacts described above. Further, to the extent that the infrastructures and expectations of these communities are based on the current status of their communities (what is there now, in 1994), the comparison has changed from that being made in 1992. Today the comparison must also take into account the current state of those communities, which has been modified either to capitalize on the inshore-offshore allocation, or for other reasons. In this context, the impacts could be even greater than previously estimated, and could be particularly disruptive to the Alaska shore based communities overall, as well as the industry sectors themselves who are directly utilizing the allocations established under amendment 18/23.

9 ASSESSMENT OF THE POLLOCK CDQ PROGRAM

This chapter is devoted to an examination of the pollock CDQ program, including discussions of the likely impacts of either continuing or discontinuing that program. The first section of this chapter, compiled by NMFS and Council staff, provides a background of the development of that program, a description of the regulatory and operating environment for the communities involved, and some of the adjustments which have been made to streamline the program.

The second section of this chapter examines some of the actual occurrences in 1994 CDQ fisheries in terms of catch, bycatch, products produced, and discard rates relative to the open access fisheries.

The third section of this document incorporates by reference a Draft Report on Economic Impacts of the Pollock Community Development Quota Program, prepared by the State of Alaska Department of Community and Regional Affairs, with assistance from the University of Alaska's Institute for Social and Economic Research. This document is included in its entirety as an Appendix VI to the EA/RIR. Major topics included in this analysis include:

1. A description of the Western Alaska region in general, with a focus on the 56 communities and six CDQ groups involved, which includes basic demographic, employment, and physical descriptive information. Much of this section is based on this region as it existed in 1990, prior to implementation of the CDQ program, and therefore provides a reference point for examining impacts of that program through 1994.

2. Descriptions of the development and logistical mechanics of CDQ program implementation. Included are detailed descriptions of the process developed for application and allocation of the CDQ reserve to the six eligible CDQ organizations. Also described in this section are the basic organizations of the six groups, their respective allocations and business partnerships, and the primary goals and objectives of each group.

3. This section provides considerable detail on the various specific projects, and the level of progress on each project for each of the six groups. The management structures and detailed statements of objectives are described.

4. Employment and direct income impacts of the CDQ program are described, with comparisons provided to the "pre-CDQ" status. Indirect effects are also estimated.

5. A final section of the report focuses on infrastructure development and fisheries activities attributable to the CDQ allocations. This section discusses the measurement of these development impacts and the issue of sustainability of these development programs, with and without the reauthorization of Amendment 18/23.

The final section of this chapter in the EA/RIR provides projections, primarily qualitative, of the impacts of allowing the program to sunset at the end of 1995, or reauthorizing the program for an additional three years.

9.1 SUMMARY OF DEVELOPMENT AND REGULATORY ENVIRONMENT

The Pollock CDQ Program's Development

In 1991, in response to the Council's inclusion of the 7.5% pollock CDQ reserve as part of Amendment 18/23, the State of Alaska developed a CDQ task force composed of members from the Department of Commerce and Economic Development, Department of Fish and Game, and the Department of Community and Regional Affairs.

This task force, in consultation with NMFS, authored a paper titled, "Western Alaska Community Development Quota Program Criteria and Procedures" (CDQ Criteria). This paper was the blue print for the CDQ program, describing its purpose and goals and the procedures by which it would be implemented and administered. The State contracted with a private consultant for completion of the Environmental Assessment/Regulatory Impact Review/Initial Regulatory Flexibility Analysis to which the CDQ Criteria was attached as Appendix I. The final rule implementing Amendment 18 (57 FR 23321, June 3, 1992), or the "inshore-offshore" amendment, approved the CDQ program in concept for a temporary period from 1992 through 1995. Amendment 18 provided only for the basic allocation of pollock for the CDQ program. The CDQ allocation provides for 7.5% of the pollock total allowable catch (TAC), or one-half of the non-specific reserve for each BSAI subarea to be set aside in a "CDQ reserve."

A regulatory amendment separate from Amendment 18 would implement the CDQ program by providing regulations specifying the contents of Community Development Plans (CDPs) and the procedures for their approval by the Secretary. Approval of a CDP by the Secretary would result in the allocation of a portion of the "CDQ reserve" to a group of eligible western Alaska communities. The Council was interested in a 1992 implementation of the CDQ program because Amendment 18 authorized the CDQ program for only four years (1992-1995). Quick action was required by NMFS to complete the implementing regulations in time for the successful CDQ applicants to harvest the available 1992 CDQ pollock quota. The proposed implementing regulations were published in the Federal Register in October (57 FR 46139, October 7, 1992). As a time-saving measure, the final rule only included the years 1992 and 1993 (57 FR 54936, November 23, 1992). A second final rule for 1994 and 1995 was published later (58 FR 32874, June 14, 1993). Immediately upon publishing the 1992/1993 CDQ final rule, the State initiated the CDQ application process, consultation with the Council on the Governor's recommendations for approved CDPs, and forwarding the recommended CDPs to the Secretary of Commerce for final approval after review and concurrence of the NPFMC. The Secretary of Commerce published the approval of the Governor's recommendations for CDPs on December 9 (57 FR 58157, December 9, 1992), and pollock CDQ fishing began.

A pollock CDQ proposed regulatory amendment (58 FR 68386, December 27, 1993) and a final regulatory amendment were completed in 1994 (59 FR 25346, May 16, 1994). This amendment requires 100 percent observer coverage on CDQ catcher vessels, observer coverage of all CDQ landings at shoreside processors, and two observers on each pollock CDQ processing vessel. The use of volumetric or scale weight measurements of total catch is also required.

The Halibut/Sablefish CDQ Program's Development

The Council proposed the Halibut/Sablefish CDQ program in conjunction with the IFQ program to provide expanded CDQ benefits to eligible western Alaska communities to help achieve the goals and purpose of the CDQ program. The IFQ proposed rule was published in the Federal Register on December 3, 1992 (57 FR 57130, December 3, 1992), and the IFQ final rule was published on November 9, 1993 (58 FR 59375, November 9, 1993).

Several amendments to the Halibut/Sablefish CDQ program have been completed. The first proposed regulatory amendment (59 FR 28048, May 31, 1994) and final regulatory amendment (59 FR 43502, August 24, 1994) raised the sablefish CDQ allocation limit for qualified applicants from 12 to 33 percent. This amendment was intended to allow total allocation of the sablefish CDQ reserve. The second proposed regulatory amendment (59 FR 49637, September 29, 1994) and final regulatory amendment (60 FR 11916, March 3, 1995) provided the CDQ compensation formula. The CDQ compensation formula compensates persons for reductions in the amount of Pacific halibut and sablefish available for harvest with IFQs in CDQ areas resulting from allocations of those fishery resources to the CDQ program.

Overall Goals and Objectives of the CDQ Programs

The CDQ programs were developed to address certain long-standing problems in the predominantly native western Alaska communities. These communities are isolated and have few natural resources with which to develop a solid, diversified economic base and stable, long-term employment. Unemployment rates are high, resulting in substantial social problems. The fisheries resources of the BSAI are adjacent to these communities, and could provide a means to develop the local economies, but the ability to participate in these fisheries is difficult because of the high capital investment needed for entry. The purpose of CDQ allocations is to provide the means to accomplish overall CDQ Program goals and objectives which are to initiate or support commercial fisheries activities which will result in ongoing, regionally based commercial fisheries economies.

Summary of the CDQ Regulations for the CDQ Programs

Both CDQ programs were designed to be as consistent and as similar as possible because the same communities will be eligible to apply for pollock, sablefish or halibut CDQ to support CDPs with the same goals and objectives. The only areas where these programs diverge is where differences are unavoidable. Therefore, the main differences in the two sets of CDQ regulations are those differences caused by the different species such as:

- CDQ reserve apportionment to CDQ groups by area
- Catch reporting and recordkeeping
- Total catch determinations by NMFS

For example, pollock is a Federal open access fishery whose CDQ reserve is 7.5% of the BSAI TAC. Catch accounting is done by NMFS' Inseason Management Branch, who supervises the progress of the CDQ fishery. The halibut fishery is managed by international agreement, the TACs and the CDQ reserves set by the IPHC for each management area, and catch monitoring is done by NMFS' Restricted Access Management Division. Finally, sablefish is a Federal restricted access fishery, whose CDQ reserve is 20% of each BSAI management area, with catch monitoring by NMFS' Restricted Access Management Division.

In all other important areas, the pollock CDQ regulations and the Halibut/Sablefish CDQ regulations are almost identical. These major areas are:

- State of Alaska responsibilities for monitoring CDQs
- Governor's CDP application process
- Governor's public hearing process to review CDP applications
- Governor's consultation with NPFMC on proposed CDPs
- Governor's written findings to the Secretary recommending approval/disapproval of proposed CDPs.
- Contents of CDPs
- Criteria and ranking factors to evaluate proposed CDPs prior to approval
- List of eligible communities
- Monitoring of CDPs
- Annual reports
- Conditions warranting the suspension or termination of a CDP

The CDQ program is basically a grant-type program, jointly managed by the Governor and the Secretary, through the NPFMC. The allocation of fish made by the Secretary to a CDQ group is based on the Secretary's judgment that the CDQ group's CDP meets the regulation's evaluation criteria and will satisfy the CDQ program's goals and objectives. The State is tasked to ensure that each CDQ group is following their CDP. The State has developed a set of regulations for each CDQ program that largely mimic the Federal regulations and place additional reporting requirements on the CDQ groups that assist the State in fulfilling its federally mandated responsibilities for monitoring the CDQ programs. The State is responsible for the day-to-day CDQ management and contact with the CDQ groups and administers the program through the Department of Community and Regional Affairs, the Department of Commerce and Economic Development, and the Department of Fish and Game. The State's lead agency for CDQ administration is the Department of Community and Regional Affairs. NMFS generally works with the State in an oversight role to ensure that the CDPs are being followed. Although the State is responsible for day-to-day management and administration, the Secretary has oversight and the final responsibility for ensuring that an allocation of CDQ fish is handled according to the CDP. Failure of a CDQ group to follow their CDP is grounds for revocation of the CDQ allocation by the Secretary.

The CDQ regulations list the western Alaska communities that are eligible to participate in the CDQ programs. A single community or a group of eligible communities create a board of directors to represent themselves. This group of communities is called the CDQ group or CDQ applicant. The CDQ group hires staff or contracts with someone to develop a Community Development Plan (CDP) containing the required information in the correct format as described in the regulations. A CDP is a request for a percentage allocation of CDQ fish, plus the CDQ group's planned development projects that would be funded with the allocation. The applicant must plan to either manage the CDP themselves and be their own managing organization, or hire a managing organization externally.

The CDQ group submits its proposed CDP to the Governor for consideration during the CDQ application period. The Governor then holds a public hearing for public review of the proposed CDPs. It is the Governor's job to review all proposed CDPs and decide whether to include them in his recommendations to the Secretary. Once the Governor has received all proposed CDPs, the percentage allocation must be negotiated with the CDQ groups. Typically, the percentage of fish requested in the proposed CDPs is more than 100 percent. Once these negotiations are complete, and the combined CDP allocation requests are equal to 100% of the CDQ reserve, the CDQ groups amend their CDPs and project plans to reflect any change in requested allocation. The Governor then prepares written recommendations to the Secretary for approval of CDPs and consults with the NPFMC on his recommendations. Following consultation, the Governor sends his recommendations to the Secretary. The Secretary approves or disapproves the Governor's recommendations as a package by publishing such approval or disapproval in the Federal Register. If approved, each CDQ group's allocation percentage is also published in that Federal Register notice. For pollock, CDQ allocations are granted for two years and Halibut/Sablefish allocations are granted for three years. The CDPs, as approved by the Secretary, are valid for the number of years of the CDQ allocations.

CDQ groups may outline projects in their CDP that directly or indirectly use the allocation of fish. For example, a CDQ group may not have the harvesting capability to use the pollock allocation, so a harvesting partner will be contracted to harvest the pollock for the CDQ group and pay the CDQ group in the form of cash per weight of pollock harvested, training, capital investment, or other benefits. The cash from the sale of harvesting rights would be used to directly support regional commercial fishing projects as described in the CDP. A CDQ group could also use an allocation of fish directly, by sub-allocating the CDQ fish to village fishermen for direct harvest at the grassroots level. Such direct use of CDQ fish is more common in the halibut CDQ fishery.

The projects outlined within each CDP also have goals and objectives with project schedules and measurable milestones. It is the status of each project's schedule and milestones that is the main focus of the annual report required by the CDQ regulations. The schedules and milestones must be met, and the project completed by the time the CDP expires. Future allocations of CDQ fish to a CDQ group are in part dependent upon how well a CDQ group completes the projects outlined in the CDP. The longer the CDQ program is in effect, the more projects can be completed, and the greater the benefit to the western Alaska communities.

Summary of the Potential Improvements to the CDQ Regulations

The Halibut/Sablefish CDQ program has just been implemented in 1995, so it is not yet clear what changes, if any, would facilitate the program. However, the pollock program has been in operation since 1992, and that practical experience has suggested several changes that could assist the smooth functioning of the program.

During pollock CDQ operations, the managing organizations must run their CDQ programs like a business. Sometimes decisions need to be made quickly to respond to ever-changing business conditions. This flexibility to respond quickly is critical to maximize the benefits to the CDQ group. At the same time, the CDQ group must follow their CDP, which usually requires notification and sometimes approval, before an amendment to a CDP can be made. This amendment process can be expensive and time consuming for the CDQ groups and removes some flexibility from business operations.

Changes could be made to the pollock CDQ regulations that give the CDQ groups more flexibility in amending CDPs, but also give the Governor and Secretary the oversight necessary to ensure that the CDPs are being followed. Currently, "any change to the budget of a CDP" would trigger a CDP amendment requiring approval by the Secretary. The regulations could be amended to more concisely define that only a material change to a CDP would be an amendment, and "material change" would be defined. If a material change to the CDP was required, it would have a shortened amendment process than currently exists. In addition, a new section could be added that defines a process of submitting an annual budget for the coming year and reconciliation of the annual budget for the previous year. This annual budget would be separate from a general CDP budget.

Discussion of Difficulties Implementing the CDQ Programs

The experience managing the CDQ fisheries in 1992 and 1993 made it clear that the CDQ fisheries required more intensive quota monitoring than the open access groundfish fisheries. The business arrangements between the CDQ groups and the harvesting partners had developed into a system where the fishing company, and in some cases a vessel, was contracted to harvest a specific portion of a CDQ group's pollock allocation. When the CDQ allocation is reached, their fishing activities must cease, and no overages are allowed. The earnings of the harvesting partners and the harvesting vessels are dependent exclusively on their own harvest of pollock, so the exact total catch numbers become critical for the vessel and harvesting partner because they want to use all of the quota to make as much profit as possible, but do not want to go over the quota because penalties would result for the CDQ group. This is a different situation from the open access pollock fisheries where an entire fleet fishes on the same quota and NMFS announces the closure of the fishery. A more intensive quota monitoring program was implemented by NMFS in May, 1994 (59 FR 25346, May 16, 1994), which included increased observer coverage for CDQ catcher vessels, processing vessels and shoreside processing plants, and the requirement to estimate total catch by volumetric methods or scale weights instead of by estimating codend size.

Shore side Processing Operations. Before the new monitoring system, the observer coverage requirements for the open access groundfish fisheries were applicable for CDQ pollock landings. Under this system, shore side processors were required to have 100 percent observer coverage if 1000 metric tons or more of groundfish were landed in a month, 30 percent observer coverage if 500-1000 metric tons of groundfish were landed, and no observer coverage was required if less than 500 metric tons of groundfish were landed. The new CDQ quota monitoring program requires 100 percent observer coverage of all CDQ landings, and the NMFS Regional Director is authorized to increase observer coverage under certain conditions. NMFS also requests shore side processors to weigh CDQ landings. Most shore side plants are equipped with a scale capable of accurately weighing CDQ pollock delivered by harvesting vessels.

Trawl Catcher Vessels. Before the new monitoring system, catcher vessels were required to have 30 percent observer coverage for vessels 60 feet LOA and over, and 100 percent observer coverage for vessels over 124 feet LOA. Under the new CDQ quota monitoring program, CDQ catcher vessels between 60 and 124 feet LOA are required to have 100 percent observer coverage. CDQ catcher vessels delivering unsorted codends to a processing vessel are exempt from the new requirements.

Processing Vessels. Processor weekly production reports, which are required by 50 CFR 675.5, have been the basis of quota monitoring in the CDQ fisheries. Comparison of observer and processor weekly production estimates of total catch has shown observer estimates to be systematically higher. For this reason, NMFS adopted the "best blend" system of estimating pollock CDQ harvests. The "best blend" compares estimates of total catch based on the processor weekly production reports with estimates of total catch made by the observers. The higher of the two estimates is selected unless the observer estimate is within 5 percent of the estimate based on the processor weekly production report, in which case the estimate based on the processor's report is selected. The "best blend" system has resulted in NMFS selecting observer estimates of total catch as the best approximation of total catch in most cases. Only one observer was required on processor vessels engaged in CDQ fishing.

Under the best blend system, an observer aboard catcher/processor trawl vessels and motherships receiving groundfish from trawl catcher vessels makes an independent volumetric estimate of as much of the total harvest as possible. The total catch is estimated by either estimating the volume of the codend or the volume of fish placed in receiving bins prior to sorting or discard. The total weight of groundfish is estimated by multiplying the estimated volume by a density factor. Catch composition sampling is used to estimate the weight of each species in the total catch. A single observer is able to estimate independently the total catch for 60 to 70 percent of the individual trawl net recoveries, or hauls, but must rely on processor logbook or production records to estimate the remaining harvest.

While the "best blend" continues to be the preferred method of estimating total catch in the open access fishery, NMFS believes that more accurate estimates of pollock harvests in the CDQ fisheries should be obtained. However, one observer, as was required, cannot independently estimate the total weight and composition of all catches by a vessel and, on many processor vessels, observers do not have adequate tools to make consistent independent volumetric estimates of total catch.

Increased Observer Coverage. Two observers, as the new monitoring system requires to be aboard a processor vessel in the CDQ fishery, will be able to estimate total catch for nearly all of the trawl net hauls without having to rely on processor log books or production records.

Estimation of Total Harvest. Using the estimated volume of the codend to estimate total catch has the greatest potential for inaccuracy because of the difficulty in accurately determining the size and shape of the codend. NMFS believes that fish holding bins of known dimensions offer a much better alternative for making volumetric estimates. However, many of the processor vessels in the CDQ fisheries did not have bins that are accessible to the observer, or the observer did not know the capacity of each bin. NMFS new monitoring system requires that processor vessels participating in the CDQ fisheries be equipped with receiving bins in which all fish catches are placed prior to sorting operations to allow observers to make more accurate estimates of the volume of fish in a bin. Such bins would have to be accurately measured with reasonably spaced marks to minimize errors when the observer estimates the amount of fish between marks. The bins must be well lighted so the observer can see the marks from outside the bin to determine the volume of fish. Refrigerated seawater (RSW) tanks could only be used for volumetric estimates of total catch if the estimates are made before water is added to these tanks.

NMFS believes that scales more accurately measure total catch weight than do volumetric estimates. Therefore, as an alternative to volumetric measurements, NMFS allows processing vessels to weigh CDQ harvests. To date, only one catcher/processor is equipped with a scale capable of accurately weighing all fish harvested.

Summary of Implementation and Operation Costs

NMFS' COSTS

	Pollock CDQ Program	
	Inseason management (GS-11)	Program Development (GS-11)
June- Dec	0.0 FTE	N/A
Dec '92	.5 FTE ($ 4,100)	.5 FTE ($ 4,100)
1993	.5 FTE ($25,000)	.5 FTE ($25,000)
1994	.5 FTE ($25,000)	.5 FTE ($25,000)
1995(estimated)	.5 FTE ($25,000)	.5 FTE ($25,000)
	$79,100	$79,100

	Halibut/Sablefish CDQ Program	
	NMFS RAM Division (GS-11)	Program Development (GS-11)
1995(estimated)	.5 FTE ($25,000)	.5 FTE ($25,000)

The above costs only include time spent by staff working directly on the CDQ programs. Travel costs or office rental/office equipment costs are not included. Other supervisory staff such as the Branch Manager, Division Chief, and Deputy Regional Director spend time on CDQ related activities as required and is not included.

Other Federal Support for the CDQ Program

In FY 1993, NMFS granted the Bering Sea Fishermen's Association (BSFA) $284,969 to assist CDQ groups in developing sound business plans, keeping CDQ participants well informed, and in developing increased public awareness of the CDQ program. In FY 1994, NMFS granted BSFA $285,000 for assisting CDQ groups in meeting Federal and State CDQ regulations and in increasing public awareness of the program. An annual grant to BSFA is anticipated for 1995 and for the foreseeable future.

State of Alaska CDQ Administration Costs

In FY 1992, the State spent approximately $95,000 on administering the CDQ program, and for FY 1993, the State spent approximately $150,000. For FY 1994, the State spent approximately $335,000 on all CDQ related administration, and for FY 1995, $310,100 has been budgeted. These amounts include salaries, benefits, travel, contractual and grants.

9.2 EXAMINATION OF 1993 and 1994 CDQ FISHERY OPERATIONS

In this section, we briefly examine some of the aspects of CDQ fishery operations relative to the issues of economic efficiency and discard rates. Data from the 1993 and 1994 fisheries are provided which summarize a comparison of CDQ vs open access fisheries in terms of retained catch and discards (BSAI pollock only). The information below (Tables 9.1 and 9.2) is limited to only vessels participating in CDQ fisheries, for both the

CDQ numbers and the open access numbers. Further, the information included is only for times when the directed fishery season was open for pollock, in order to make valid comparisons of discard rates. Total catch in the CDQ fisheries is taken from blend data in order to allow comparisons to the open access fisheries. Blend data was not the official source used to monitor CDQ catch totals, and therefore the CDQ catch totals are somewhat greater than actually estimated in official sources[2].

Table 9.1 Retained and Discarded Catch Comparison of CDQ Processors During the CDQ and OPEN Seasons in 1993

Season	Discarded	Retained	Total
CDQ MT	2,888	123,338	126,227
CDQ %	2.29%	97.71%	100.00%
OPEN MT	21,432	432,178	453,611
OPEN %	4.72%	95.28%	100.00%
TOTAL MT	24,321	555,517	579,837
TOTAL %	4.19%	95.81%	100.00%

Table 9.2 Retained and Discarded Catch Comparison of CDQ Processors During the CDQ and OPEN Seasons in 1994

Season	Discarded	Retained	Total
CDQ MT	1,248	137,907	139,155
CDQ %	0.90%	99.10%	100.00%
OPEN MT	11,923	572,837	584,760
OPEN %	2.04%	97.96%	100.00%
TOTAL MT	13,171	710,744	723,914
TOTAL %	1.82%	98.18%	100.00%

Table 9.3 Product, Product Mix and Utilization Rate Comparisons of CDQ Processors During the CDQ and OPEN Season in 1994

Season	Roe	Fillets	Surimi	Minced	Meal/Oil	Total Product & Utilization Rate
CDQ MT	1,059	9,186	7,294	4,130	1,535	23,204
% of Total Product	4.56%	39.59%	31.43%	17.80%	6.62%	16.68%
OPEN MT	3,711	21,825	40,952	4,430	12,671	83,589
% of Total Product	4.44%	26.11%	48.99%	5.30%	15.16%	14.29%

From the information above, the CDQ fisheries exhibit a substantially lower discard rate when compared to open access pollock fisheries (2.29% vs 4.72% in 1993 and .9% vs 2.04% in 1994). The discard rate in the open access fisheries is roughly double that of the same vessels in CDQ fisheries. The information also shows a substantial reduction in discards when comparing 1993 to 1994 fisheries, for both open access and CDQ operations. The allocation of fixed quotas to each operation, combined with the slower pace of fishing which is

[2]NMFS placed two observers on each CDQ vessel and relied strictly on observer reports to monitor attainment of CDQs. Official estimates of CDQ total harvests were very close to the 7.5% allocation to CDQs.

allowed in a CDQ fishery, would theoretically lead operators to increase the value added to their product line. This is verified by the information in the Table 9.3 which shows a significant increase in the percentage of fillet and mince production in the CDQ fisheries when compared to the open access fishery and lower percentages going into surimi and meal.

a more detailed examination of the vessels participating in both the open access and CDQ fisheries is contained in a report titled "CDQ and Open Access Pollock Fisheries in the Eastern Bering Sea: a Comparison of Discard Rates, Product Values, and Fishing Effort," in preparation by NMFS economists.

9.3 DESCRIPTION OF ECONOMIC AND INDIRECT IMPACTS

The most recent and succinct summary of the direct and indirect impacts of the CDQ program to the six CDQ organizations is provided in the "Draft Report on Economic Impacts of the Pollock CDQ Program," compiled by the State of Alaska Department of Community and Regional Affairs with assistance from the UAA Institute for Social and Economic Research. This report is appended in its entirety to this EA/RIR, and provides at least partially, the reference point for evaluating the impacts of either continuing or discontinuing the CDQ program. These findings are discussed in the following sections of this chapter.

9.4 POTENTIAL IMPACTS OF PROGRAM EXPIRATION OR CONTINUATION

Without reauthorization of the Inshore-Offshore Allocation and the Pollock CDQ Program, the 56 affected communities, organized into six separate CDQ organizations, will no longer be given an exclusive share of the pollock resource. The 7.5% allocation yields in the neighborhood of $30 million exvessel value annually to the CD program recipients. These direct benefits likely understate total economic benefits to these communities, due to the indirect benefits generated from the development projects undertaken by the program. Additionally, the direct and indirect impacts of the monies generated by the program represent a differentially higher economic impact when compared to other regions of the state and the United States in general. This is due to the relative absence of alternative economic bases in these communities. The social benefits attributable to this program are quite clear, as described in the DCRA report attached, and have not been the subject of debate during the program or in consideration of extending the program. The fundamental question at this time is whether the program has accomplished the overall goals intended by the Council and the specific goals as outlined by the individual CDQ organizations.

The ideal approach to answering this question would be to quantify, to the extent possible, the relative completions of the major development projects initiated by the CDQ groups. Secondly, the resources necessary to complete, and subsequently utilize, these infrastructures would need to be measured. This would specifically include, for each project, the necessity of a direct pollock allocation as the means to realize project completion, and perhaps more importantly, continued utilization of those development projects. a quantitative attempt at such an analysis is beyond the scope of this EA/RIR, and would be difficult to quantify under any circumstances. However, based on information contained in the DCRA report and other sources, it is possible to conduct a qualitative examination of this issue. Two fundamental questions are (1) whether the development projects underway or expected can be brought to fruition without an allocation of pollock, and (2) once completed, whether they can be sustained in the absence of a direct pollock allocation.

As is outlined in the DCRA report, many of the development projects initiated through the CDQ program have been completed, while many more are still in development stage. If this program is allowed to expire at the end of 1995, it is true that the short duration of the program (part of 1992 and all of 1993 and 1994) will have resulted in the creation of infrastructures that did not previously exist, as well as a leg up on further infrastructures. The DCRA report indicates that of the projects identified as necessary to accomplishment of program goals, 61% have been completed, or are significantly underway. It will also have resulted in a short term infusion of money and economic activity previously unrealized in the participating communities. Though these benefits are real and irrefutable, they may not serve to accomplish the overall, long range goal of the program to bring these communities into the BSAI fisheries in a self-sustaining manner—one which allows them to make participation in the fisheries a fundamental and important part of their overall economies and lifestyles.

Chapter IV of the DCRA report provides an overview of the activities of all six CDQ groups, broken down by categories of (1) projects completed or significantly underway, (2) projects in the development and planning stage, and for which investments in both money and personnel have been devoted, and (3) potential future projects. These are further broken down into categories such as administration, business development, employment, investments, fishery development, infrastructure, processing, and training. All groups are involved to varying degrees in each of these categories. What is significant in this report is that, although many accomplishments have been realized, many more are still in their infancy. Without continuation of the direct pollock allocation beyond 1995, most of these projects will likely stagnate, in the absence of alternative support.

Two and one-half years has proven to be enough time to lay the groundwork for these communities, to establish business relationships and management structures as necessary, and lay the foundations of many of the projects needed to bring the goals of the program(s) to fruition. It does not appear to have been enough time to actually accomplish the overall intent of the program as created by the Council. Direct economic infusions, via pollock allocations to these six groups, will be necessary to allow them to bring these projects to completion. Additional time is also needed to incorporate the residents of these communities directly into the fisheries through training programs currently underway. To the extent that many of these development projects will stall in the absence of a continuation of the program, the investments made to date will represent "sunk costs" which are likely irretrievable and therefore translate into economic losses attributable to the current program.

These losses may be quantifiable, though no attempt is made to do so in this analysis. What is less quantifiable, but perhaps most important, is the social impact to the residents of these communities which would occur if these accomplishments were nullified, and the prospect of real involvement in the fisheries as an economic base for the communities is removed. As postulated in the DCRA report, there are various issues which may be examined as indicators of progress towards program development, but three important questions have been identified:

(1) *What is the level of jobs and income which have been created and how do these compare to previous conditions?* Examination of this question indicates that, though there is variance between the CDQ groups, overall jobs and income have increased relative to previous conditions. Furthermore, the increase in **basic**, fisheries related jobs, where this is very little alternative economic base, is a significant achievement. However, the report also finds that this increase has not transformed the region overall economically in the short two and one-half years of the program.

(2) *Are new economic activities resulting in local control and decision making relative to fisheries development?* Once allocations are made between the six CDQ groups, the process allows for control decision making at the local CDQ group level, with input from the industry partners. It is likely that as the development initiatives are realized, this control will be further deterred at the local level.

(3) *Are the benefits sustainable and will they be likely to continue in the absence of the direct allocation?* This question appears to epitomize the issue under consideration—whether to continue the program for an additional period of time. As noted earlier, some of the infrastructures and resident training which has occurred will contribute to the region's future growth and viability even if the program were to be discontinued. On the other hand, if the initiatives to date are not sufficient to bring this region into the fisheries in a meaningful way, then the discontinuation of the program will likely result in a regression to the status occurring prior to the program's implementation.

In summary, it does not appear to be a valid expectation that the program could or should transform the region in a few short years. The necessity of providing a direct allocation of the pollock resource for an additional period of time appears obvious, if there is to be any realistic expectation that the overall program goals will be realized. If such a reauthorization is deemed appropriate by the Council, it may be in the best interest of the CDQ recipients, as well as in the interests of achieving overall program goals, if the Council provides some indications in that reauthorization of what the expectations of the recipients should be for the next three years. Development programs can only be planned effectively if the context of those initiatives is known to the planners.

If the intent is to simply remove the allocation after three more years, then the CDQ groups know that the initiatives they develop have to not only provide the infrastructure for fisheries involvement, but also the ability to procure the raw materials necessary to successfully utilize that infrastructure. The planning and development which would occur over the next three years will be quite different if the groups can expect a continued guarantee of pollock (and income), either through the current mechanism or through some other mechanism developed as part of the overall CRP initiative of the Council.

The benefits to the recipients of any direct allocations of resource must be weighed against the costs to the remainder of the industry and the nation as a whole. In the case of the CDQ program, the Council felt that the benefits, both economic and social, of the CDQ allocation outweighed the costs to other industry sectors which are already characterized by overcapitalization and fierce competition for available quota. Given the current status of the program's development, the impacts of the allocation decision are likely magnified in the current consideration. For example, allowing the program to expire at this time may make the program recipients technically no worse off than they were before the allocation; however, the real and perceived negative impacts are probably greater now that the program has partially reached attainment of its goals. Therefore, the trade-offs between economic and social benefits to the CDQ recipients, and costs to the remainder of the fleet, would appear to be greater in today's context than in 1992. It is also true that at least some of the costs of the program are recouped by industry partners in the CDQ operations, which also fish in the open access fisheries.

The final consideration discussed here is relative to the benefits of the CDQ portion of the fishery in terms of harvest of pollock, economic efficiencies in that harvest mode, and bycatch and discards associated with that harvest mode. As described in Section 5.2, harvests occurring within the CDQ fisheries are characterized by a slower pace of fishing, increased accuracy of catch and bycatch monitoring, more efficient utilization of catch, and reductions in discards. Reductions in bycatch of non-target and prohibited species are also commonly attributed to these fisheries, though no quantitative verification has been undertaken in this study. All of these positive aspects of these fisheries represent increased overall returns to the nation from the pollock fishery resource. This is expected to occur wherever portions of the quota are removed from the race for fish and allocated directly to a recipient who receives a guaranteed harvest and the individual accountability that accompanies that guarantee.

10 PREFERRED ALTERNATIVE

The Council approved the reauthorization of Fishery Management Plan Amendments 18 and 23 which contain the Inshore-Offshore Allocations of Pollock in the BSAI and of pollock and Pacific cod in the GOA, and the continuation of the Pollock CDQ program for Western Alaska. These amendments will be enacted as Amendment 40 to the GOA Groundfish FMP and Amendment 38 to the BSAI Groundfish FMP. The Council also made some minor changes to the Catcher Vessel Operational Area (CVOA), and recommended that the community of Akutan be added to the list of CDQ communities, contingent upon further study Akutan's eligibility.[1] If approved by the Secretary of Commerce, the reauthorization will extend the life of the allocations and the pollock CDQ program for three years through the end of 1998. The Council also asked that any other regulations that deal with the inshore and offshore sectors also be reauthorized, including an extension of the delay of the start of the "A" Season for the offshore sector.

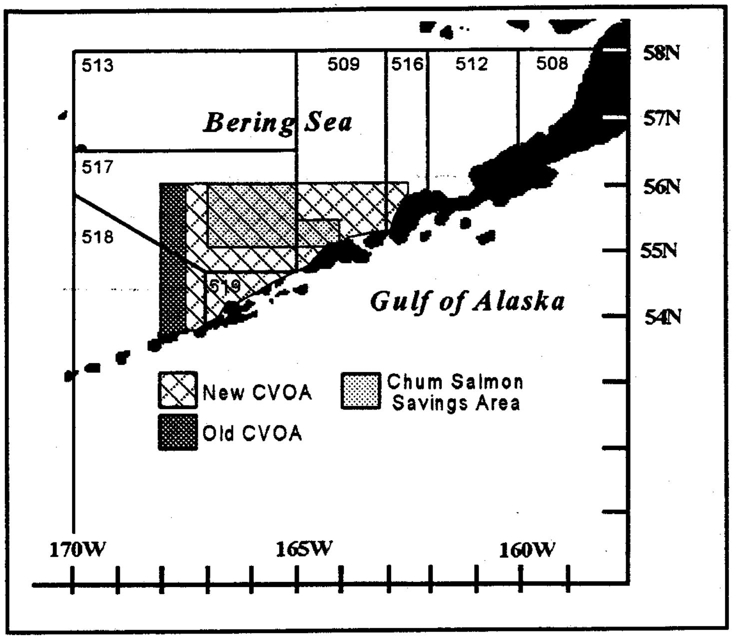


Figure 10.1 The CVOA is defined as the area in the Bering Sea south of 56°00' N. latitude, and between 163°00' and 167°30' W. longitude.

Amendment 40 to the GOA FMP allocates 100% of the pollock and 90% of the Pacific cod to "inshore catcher processors" or to harvesting vessels delivering to "inshore" processors. Under Amendment 38 in the BSAI, 7½% of the pollock TAC is allocated to the Pollock CDQ Program, another 7½% of the pollock TAC is set aside as part of the non-specific reserve which may, at the discretion of the Regional Director, be released back into any BSAI fishery, including pollock. The remaining portion of the pollock TAC is divided between inshore and offshore harvesters; 35% to harvest vessels delivering to "inshore" processors or to "inshore catcher processors," and 65% to "offshore catcher processors" or to harvest vessels delivering to "offshore processors." Further, a CVOA is defined for the pollock "B-Season," within which only catcher vessels may operate. In its reauthorization action, the Council voted to shift the western border of the CVOA 30 minutes to the east to 167°30' W. longitude, and to allow the offshore catcher processors to use the CVOA after the inshore pollock quota has been taken for the year. The newly defined CVOA is shown in Figure 10.1 with statistical reporting areas and the chum salmon closure area.

The Council considered two basic alternatives in its analyses of the proposed reauthorization of the inshore/offshore allocations: (1) No Action, which would allow the allocations to expire at the end of 1995, and (2) Reauthorize the allocations 'as is', including the pollock CDQ program, for an additional three years. Within Alternative 2, reauthorization of the allocations, the Council also considered minor changes to the provisions of the CVOA as described in subsequent sections of this Chapter. The Council discussed, and rejected, other alternatives for formal analysis which were proposed either in the original inshore/offshore discussions or in the more recent iteration. For example, it was proposed in 1994 (as it was in 1991) that the Council consider a direct allocation to harvest vessels, without the specific requirements as to where these vessels would deliver; i.e., inshore or offshore processors. This was rejected by the Council as a viable alternative for the following reasons:

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[1]If Akutan is determined to be eligible for participation in the CDQ program, then a separate regulatory amendment will be used to enact the change.

(1) The original problem to be addressed by these amendments, as well as a potential problem in the current iteration, is possible preemption of one processing sector over the other. A direct allocation to harvest vessels, without further requirements for delivery, does not address this problem.

(2) Although preemption is a consideration in the current iteration, the more critical issue at this time (as reflected in the current Problem Statement) is the potential disruption and industry instability which could ensue in the absence of the current regulations which implement Amendments18/23. The Council considers the continuation of the current allocational structure to be critical to maintaining industry business relationships, planning horizons, and overall stability across industry sectors while the Council develops a more permanent solution for these fisheries over the next three years. This perspective is consistent with, and reinforces, the original intent of the Council with regard to Amendments 18/23. Continuation of the allocations, in the form of Amendments 38/40 will allow the Council time to realize this intent. Pursuing dramatically different alternative remedies at this time was viewed as counterproductive by the Council.

In reaching their decision to reauthorize inshore-offshore, the Council relied on the information contained in the original EA/RIR dated May 4, 1995, as well as information provided by the public in comments and testimony at the Council meeting. The Council also relied on presentations from its Staff and from the SSC and the Advisory Panel. Staff indicated that updated information regarding 1994 product prices and 1993 production information had become available, and that a preliminary examination of that information did not result in any changes in the conclusion drawn in the EA/RIR. The Council concurred with those findings overall and concluded that reauthorizing the inshore-offshore allocations for an additional three year period was essential in providing stability to the industry while allowing the Council adequate time to further develop its Comprehensive Rationalization Plan (CRP). The Council concluded unanimously that allowing the allocations to expire could create disruptions and redistributions of existing harvesting and processing activities which could seriously jeopardize further CRP development. In addition to public testimony which overwhelmingly favored this reauthorization, the Council relied on information contained within this EA/RIR which offered supporting findings for that decision. Some of the major points found within the analysis, as described in the Executive Summary and elsewhere, include:

1. Allowing the allocations to expire could result in an estimated 6% redistribution of processing activity (from shore-based to at-sea) compared to the existing percentages.

2. Given current data on prices and product forms, it is estimated that the original projections of net losses to the nation were overstated, and that actual cost/benefit effects tend more towards the neutral point (though some net losses may still accrue). There are many caveats to this finding which are detailed throughout the main document. The primary caveat is the lack of updated cost information, from that used in the initial studies. The lack of new cost information essentially nullified the ability of analysts to complete a full cost-benefit analysis of the reauthorization of these allocations.

3. Distributional income impacts, originally projected to be net negative, were also likely overstated and are estimated to be reduced in the current analysis. Impacts to Alaskan coastal communities (projected to be positive) are more critical to these economies than negative impacts projected for Pacific Northwest communities. Again the lack of updated cost information put limits on the certainty of these findings.

4. From both the analytical document and public testimony from industry sectors, it is apparent to the Council that continuation of the allocations for an additional three years is essential to successful completion of the CRP program, which will include permanent solutions to the problems currently addressed by these amendments. Stability across industry sectors during the next three years is considered critical to the CRP development. At its June 1995 meeting, the Council initiated development of a BSAI pollock ITQ program which encompasses both the harvesting and processing sectors.

Likewise, the information presented relative to the pollock CDQ program indicated that, although many accomplishments have been made, the three year duration of the program has not been adequate to complete many of the development projects initiated. As such, the Council felt that an extension of this program was necessary to fully realize the goals which were envisioned in the original creation of the program.

The following two sections contain the actual changes to the GOA and BSAI Groundfish FMPs (Amendments 40 and 38 respectively) and a comparison to Amendments 23 and 18.

10.1 AMENDMENT 40 TO THE GOA GROUNDFISH FMP

Changes to the FMP:

1. Section 4.3.1.1 is changed to read as follows:

4.3.1.1 Permit Requirements

All U.S. vessels fishing in the Gulf of Alaska and all U.S. processors receiving fish from the Gulf of Alaska must have current permits issued annually by the Secretary of Commerce.

2. Replace Section 4.3.1.6 in its entirety as follows:

4.3.1.6 Inshore-offshore allocations of pollock and Pacific cod

The allowed harvests of Gulf of Alaska pollock and Pacific cod will be allocated between the inshore and offshore components of industry in specific shares in order to lessen or resolve resource use conflicts and preemption of one segment of the groundfish industry by another, to promote stability between and within industry sectors and affected communities, and to enhance conservation and management of groundfish and other fish resources.

4.3.1.6.1 Definitions

Inshore is defined to consist of three components of the industry:

1) All shoreside processors as defined in federal regulations.
2) All catcher/processors which meet length requirements defined in federal regulations and which have declared themselves to be "Inshore".
3) All motherships or floating processors which have declared themselves to be "Inshore."

Offshore is defined to consist of two components of the industry:

1) All catcher/processors not included in the inshore processing category, or which have declared themselves to be "Offshore."
2) All motherships and floating processing vessels not included in the inshore processing category, or which have declared themselves to be "Offshore."

4.3.1.6.2 Declarations and operating restrictions

Annually before operations commence, each mothership, floating processing vessel and catcher/processor vessel must declare on its Federal Permit application whether it will operate in the inshore or offshore component of industry. This declaration must be the same for both the BSAI and the GOA if applications for both are made. All shoreside processors will be in the inshore component. Once declared, a vessel cannot switch to the other component, and will be subject to restrictions on processing amounts or locations for pollock and Pacific cod for the rest of the fishing year. Harvesting vessels can choose to deliver their catch to either or both components.

Catcher Processors which have declared themselves to be inshore have the following restrictions:

1) The vessel must be less than 125' LOA.
2) The vessel may not catch or process more than 126 mt (round weight) of pollock or GOA Pacific cod in combination in a given week of operations.

Motherships and floating processors which have declared themselves to be inshore have the following restriction:

1) Processing from a directed pollock fishery or a directed GOA Pacific cod fishery must occur in a single location within the waters of the State of Alaska.

4.3.1.6.3 Allocations

One hundred percent of the allowed harvest of pollock is allocated to inshore catcher/processors or to harvesting vessels which deliver their catch to the inshore component, with the exception that offshore catcher/processors, and vessels delivering to the offshore component, will be able to take pollock incidentally as bycatch in other directed fisheries. All pollock caught as bycatch in other fisheries will be attributed to the sector which processes the remainder of the catch.

Ninety percent of the allowed harvest of Pacific cod is allocated to inshore catcher/processors or to harvesting vessels which deliver to the inshore component and to inshore catcher processors; the remaining ten percent is allocated to offshore catcher/processors and harvesting vessels which deliver to the offshore component. All Pacific cod caught as bycatch in other fisheries will be attributed to the sector which processes the remainder of the catch.

These allocations shall be made by subarea and period as provided in federal regulations implementing this FMP.

4.3.1.6.4 Reapportionment of unused allocations

If during the course of the fishing year it becomes apparent that a component will not process the entire amount of the allocation, the amount which will not be processed shall be released to the other component for that year. This shall have no impact upon the allocation formula.

4.3.1.6.5 Duration

Inshore-offshore allocations of pollock and Pacific cod shall cease to be a part of this FMP either (1) at midnight on December 31, 1998; or (2) earlier if replaced with another management regime approved by the Secretary.

10.1.1 Comparison of GOA Amendment 23 and Amendment 40

The Council's action in June of 1995 advises the Secretary of Commerce to reauthorize the inshore-offshore action in the GOA without change. Specifically, the language defines inshore and offshore sectors and allocates 90% of the allowable Pacific cod and 100% of the pollock fishery to the inshore sector. With respect to pollock, the offshore sector is allowed only to harvest pollock as bycatch in other directed fisheries. The basic structure of the plan amendment language remains unchanged. Some changes to the plan amendment language have been made for clarity and to ease regulation and enforcement of the action. The principle changes in the language are found in the definitions (Section 4.3.1.6.1) and declarations and operating restrictions (Section 4.3.1.6.2).

The changes in the definitions allow NMFS to assign mobile processors, i.e., catcher/processors, motherships and floaters,[2] to either the inshore or offshore sectors of the industry based on declarations of the processors on

[2]All shoreside processors will be part of the inshore sector, regardless of their permit status.

their application for a federal permit. This was the intent of the Council in enacting Amendment 23, however, this was not possible because there was no processing permit requirement in 1992 at the time of the initial implementation. With the implementation of the North Pacific Research Plan (Amendment 30), processors of federally managed groundfish and crab are required to be permitted, thereby providing a vehicle in which processors can declare their intent to be part of the inshore or offshore sector. The changes in the language on declarations and operating restrictions clarify the permitting process and explicitly require mobile processors to meet certain requirements in order to be a part of the inshore sector.

With these changes, the NMFS will no longer have to assign a sector to a vessel based on performance as was done under the previous iteration. In the past this was done using the first week of data submitted by the processor. In the case of catcher processors, a vessel would be assigned to the inshore category if it was less than 125' LOA and in the first week it processed less than an average of 18 mt per day. If at some point in the future the vessel processed more than 18 mt per day on average in a given week, the entire years catch would be reassigned to the offshore sector harvest. Similarly if a floater, initially assigned to the inshore sector moved locations within the year, the catch would be reassigned to the offshore sector. These reassignments created the potential for overharvest in the offshore sector. With the changes to the plan language, NMFS will be able to develop regulations that require processors to stay within the operating restrictions. If a processor assigned to the inshore sector violates these restrictions, NMFS will be able to sanction the processor, rather than merely reassigning the catch to the offshore sector.

10.2 AMENDMENT 38 TO THE BSAI GROUNDFISH FMP

Changes to the FMP:

1. Section 14.4.1 is changed to read as follows:

14.4.1 Permit Requirements

All U.S. vessels fishing in the Bering Sea or Aleutian Islands sub-management areas and all U.S. processors receiving fish from the Bering Sea or Aleutian Islands sub-management areas must have current permits issued annually by the Secretary of Commerce.

2. Replace Section 14.4.11 in its entirety as follows:

14.4.11 Inshore-offshore allocations of pollock

In addition to the provisions of Section 14.4.10, the allowed harvest of Bering Sea and Aleutians pollock will be allocated between the inshore and offshore components of industry in specific shares in order to lessen or resolve resource use conflicts and preemption of one segment of the groundfish industry by another, to promote stability between and within industry sectors and affected communities, and to enhance conservation and management of groundfish and other fish resources.

14.4.11.1 Definitions

Inshore is defined to consist of three components of the industry:

1) All shoreside processors as defined in federal regulations.
2) All catcher/processors which meet length requirements defined in federal regulations and which have declared themselves to be "Inshore."
3) All motherships or floating processors which have declared themselves to be "Inshore."

Offshore is defined to consist of two components of the industry:

1) All catcher/processors not included in the inshore processing category, or which have declared themselves to be "Offshore."
2) All motherships and floating processing vessels not included in the inshore processing category, or which have declared themselves to be "Offshore."

The Secretary is authorized to suspend the definitions of inshore and offshore as prescribed by federal regulations implementing this FMP to allow for full implementation of section 14.4.11.5.

14.4.11.2 Declarations and operating restrictions

Annually before operations commence, each mothership, floating processing vessel and catcher/processor vessel must declare on its Federal Permit application whether it will operate in the inshore or offshore component of industry. This declaration must be the same for both the BSAI and the GOA if applications for both are made. All shoreside processors will be in the inshore component. Once declared, a vessel cannot switch to the other component, and will be subject to restrictions on processing amounts or locations for pollock for the rest of the fishing year. Harvesting vessels can choose to deliver their catch to either or both components.

Catcher processors which have declared themselves to be inshore have the following restrictions:

1) The vessel must be less than 125' LOA.
2) The vessel may not catch or process more than 126 mt (round weight) of pollock or GOA Pacific cod in combination in a given week of operations.

Motherships and floating processors which have declared themselves to be inshore have the following restriction:

1) Processing from a directed pollock fishery or a directed GOA Pacific cod fishery must occur in a single location within the waters of the State of Alaska.

14.4.11.3 Allocations

The allowed harvest of BSAI pollock shall be allocated as follows: Thirty-five percent (35%) of the pollock in each subarea, for each season, will be allocated to the inshore component beginning in 1996 and continuing through 1998. By the same action, the offshore fleet will be allocated 65% of the pollock resource beginning in 1996 and continuing through 1998 in each subarea and in each season. The percentage allocations are made by subarea and period as provided in federal regulations implementing this FMP. All pollock caught as bycatch in other fisheries will be attributed to the sector which processes the remainder of the catch.

14.4.11.4 Reapportionment of unused allocations

If, during the course of the fishing year, it becomes apparent that a component will not process the entire amount of the allocation, the amount which will not be processed shall be released to the other component for that year. This shall have no impact upon the allocation formula.

14.4.11.5 Western Alaska Community Quota

For a Western Alaska Community Quota, 50% of the BSAI pollock reserve as prescribed in the FMP will be held annually. This held reserve shall be released to communities on the Bering Sea Coast which submit a plan, approved by the Governor of Alaska, for the wise and appropriate use of the released reserve.

The Western Alaska Community Quota program will be structured such that the Governor of Alaska is authorized to recommend to the Secretary that a Bering Sea Rim community be designated as an eligible fishing community to receive a portion of the reserve. To be eligible a community must meet the specified criteria and have developed a fisheries development plan approved by the Governor of Alaska. The Governor shall develop such recommendations in consultation with the Council. The Governor shall forward any such recommendations to the Secretary, following consultation with the Council. Upon receipt of such recommendations, the Secretary may designate a community as an eligible fishing community and, under the plan, may release appropriate portions of the reserve.

14.4.11.6 Bering Sea Catcher Vessel Operational Area

For directed pollock harvesting and processing activities, a catcher vessel operational area (CVOA) shall be defined as inside 167°30' through 163° West longitude, and 56° North latitude south to the Aleutian Islands. The CVOA shall be in effect commencing on the date that the second allowance of pollock is available for directed fishing until the inshore allocation is taken, or the end of the fishing year. Only catcher vessels and catcher/processors fishing under the Western Alaska Community Quota Program, defined in section 14.4.11.5, may participate in a directed pollock fishery in this area during this period.

14.4.11.7 Duration

Inshore-offshore allocations of pollock, the CVOA, and the Western Alaska Community Quota program shall cease to be a part of this FMP either (1) at midnight on December 31, 1998; or (2) earlier if replaced with another management regime approved by the Secretary.

10.2.1 Comparison of BSAI Amendment 18 and Amendment 38

The Council's action in June of 1995 advises the Secretary of Commerce to reauthorize inshore-offshore in the BSAI with some minor changes to the implementation of the CVOA. Specifically, the language defines inshore and offshore sectors and allocates 35% of the pollock fishery to the inshore sector and 65% to the offshore sector. Additionally, the amendment language moves the Western border of the CVOA, and allows the offshore sector to operate in the CVOA during the B season once the inshore quota is taken. The basic structure of the plan amendment language remains unchanged, with the exception of the same changes made to sections regarding definitions, declarations and operating restrictions to ease regulation and enforcement of the action.

10.3 Changes to the CVOA

The changes to the CVOA were made by the Council at the June 1995 meeting even though those changes had not been part of the specific alternative analyzed. The analysis before the Council, with the addition of public comment, provided sufficient information for the Council to make these changes. Specifically, the Council moved the Western border of the CVOA from 168° W. longitude to 167°30' W. longitude, and allowed the offshore sector to operate in the CVOA during the B season once the inshore quota is taken.

The information in Chapter 2 of the EA/RIR, as well as the figures in Appendices I[3] and II, and comment made by the American Factory Trawlers Association at the June Council meeting, provided sufficient evidence to the

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[3]Of particular relevance are figures on pages 19 and 20 of Appendix I. These show trawl locations and CPUEs of Pollock from Observer data of Catcher Processors and Catcher Vessels during the 1993 "B" season. On page 19 we see that the Catcher Processor Fleet heavily fished the area just outside the CVOA to the north and west. On page 20 we see that little activity was recorded by catcher vessels. These figures also show the location of the Pribilof Trawl Closure, which has further restricted available grounds, and therefore increased the importance of the additional area under the revised CVOA available to the offshore sector.

Council that the shift in the Western border of the CVOA would not significantly impact the catcher vessels operating in the CVOA during the B season, nor would there be a significant impact on marine mammals. The offshore sector would benefit by having the option to fish in additional areas of the Bering Sea, without negatively impacting overall bycatch of salmon and other prohibited species, and without negatively impacting the onshore sector operations.

10.4 INFORMATION NOT AVAILABLE IN EARLIER DRAFTS

Chapters 4, 5 and 6 are based on the best information available at the time the document was made available to the public. Since that time, updated production and price information has been obtained. This information was referenced in presentations to the AP, SSC and the Council at the June meeting. Recall that 1993 product mix information was not available nor was product price information available for 1994. Therefore, 1993 prices were applied to 1994 production data to obtain the results in the EA/RIR. In order to provide an accurate record of the information available to the Council and the public, we have chosen not to incorporate this updated information into the main body of the original EA/RIR. Rather, these data are presented below and their impact on the findings in the EA are discussed. Additionally, Section 10.3.3 contains a complete set of "replacement tables," which would result from the updated data.

10.4.1 1993 Production Data

Data on products and product mix from the pollock fisheries and the GOA Pacific cod fisheries were unavailable at the time the original EA/RIR was made available to the public and the Council. Since that time, this information has been obtained. Tables 10.1, 10.2 and 10.3 show production of various products from GOA Pacific cod and from GOA and BSAI pollock by inshore and offshore sectors. Information in Table 10.1 may be inserted into Table 4.2 on page 135 between the 1992 and 1994 data. Information in Table 10.2 and 10.3 may be inserted into Table 4.19 on page 148, and Table 4.23 on page 169. In general, the 1993 production data contains no surprises, particularly when viewed together with 1992 and 1994 information in Chapter 4. 1993 Pacific cod data is indeed very similar to 1992 data for the inshore sector with some reductions in H&G and Fillet production. Offshore production is very limited due to the full implementation of Amendment 23. Pollock production from the GOA is similar to production in 1994 with some shifting from fillets and mince in 1993 to more surimi in 1994.

Table 10.1 1993 Gulf of Alaska Pacific Cod Processed Products

	Whole	H & G	Fillets	Roe	Other	Minced	Meal/Oil	Total
Inshore	8,307	4,215	6,726	1,037	570	444	0	21,298
% of Sector Products	39.00%	19.79%	31.58%	4.87%	2.67%	2.08%	0.00%	100.00%
% of Gulf Product	99.86%	91.58%	99.88%	99.72%	100.00%	99.85%	100.00%	98.11%
Offshore	12	388	8	3	-	1	-	411
% of Sector Products	2.93%	94.31%	1.90%	0.71%	0.00%	0.17%	0.00%	100.00%
% of Gulf Product	0.14%	8.42%	0.12%	0.28%	0.00%	0.15%	0.00%	1.89%
GOA Total	8,319	4,603	6,734	1,040	570	444	0	21,710
% of Gulf Total	38.32%	21.20%	31.02%	4.79%	2.62%	2.05%	0.00%	100.00%

Table 10.2 1993 Pollock Production Data for the GOA by Sector

Sector		H & G	Roe	Fillets	Surimi	Minced	Meal/Oil	Total
Inshore	Tons	431	434	11,481	6,049	3,181	1,510	23,085
	% of Sector Total Product	1.87%	1.88%	49.73%	26.20%	13.78%	6.54%	100.00%
	% of GOA Total	1.87%	1.88%	49.73%	26.20%	13.78%	6.54%	100.00%

Table 10.3 1993 Pollock Production Data for the BSAI by Sector

		H & G	Roe	Fillets	Surimi	Minced	Meal/Oil	Total
Inshore	Tons	594	1,601	10,556	69,235	3,515	40,661	126,162
	% of Sector Total Product	0.47%	1.27%	8.37%	54.88%	2.79%	32.23%	100.00%
	% of BSAI Total	10.95%	13.99%	18.63%	47.97%	26.60%	63.99%	42.82%
Offshore	Tons	4,825	9,847	46,108	75,103	9,702	22,881	168,466
	% of Sector Total Product	2.86%	5.85%	27.37%	44.58%	5.76%	13.58%	100.00%
	% of BSAI Total	89.05%	86.01%	81.37%	52.03%	73.40%	36.01%	57.18%
BSAI Total	Tons	5,418	11,449	56,664	144,339	13,217	63,542	294,628
	% of Total Products	1.84%	3.89%	19.23%	48.99%	4.49%	21.57%	100.00%

10.4.2 **1994 Product Price Data**

Preliminary 1994 product price data became available in June of 1995. Table 10.4 shows Pacific cod product price data by sector for 1994. Table 10.5 shows pollock product price data by sector for 1994. These data may be appended to Tables 4.1a on page 122 of the EA/RIR. Table 10.6 shows Pacific cod product price data and may be added to Tables 4.1b also on page 122. This information, even though preliminary, will more accurately reflect the revenues resulting from the 1994 fishery than the 1993 price data used in the main body of the document. Comparing 1994 preliminary prices to 1993 prices, we see an increase in surimi prices for both sectors with the difference between sectors becoming less pronounced. Roe and H&G prices, as well as inshore mince price increased, while fillet and offshore mince prices decreased.

Table 10.4 1994 Product Prices For Pacific Cod

Sector	Units	Whole	H & G	Fillets	Roe	Other	Minced	Meal/Oil
Inshore	$/lb.	$ 0.432	$ 0.713	$ 1.433	$ 0.688	$ 1.702	$ 0.338	$ 0.203
	$/mt.	$ 952.40	$ 1,571.30	$ 3,159.30	$ 1,515.63	$ 3,751.96	$ 745.94	$ 48.28
Offshore	$/lb.	$ 0.298	$ 0.778	$ 1.677	$ 0.772	$ 1.504	$ 0.751	$ 0.244
	$/mt.	$ 657.55	$ 1,716.16	$ 3,696.90	$ 1,701.74	$ 3,315.92	$ 1,654.97	$ 537.10

Table 10.5 1994 Product Prices For Pollock

Sector	Units	H & G	Roe	Fillets	Surimi	Minced	Meal/Oil
Inshore	$/lb.	$ 0.486	$ 3.941	$ 0.942	$ 0.900	$ 0.430	$ 0.192
	$/mt.	$ 1,071.44	$ 8,688.33	$ 2,076.73	$ 1,984.14	$ 947.98	$ 423.28
Offshore	$/lb.	$ 0.317	$ 5.750	$ 1.031	$ 0.930	$ 0.370	$ 0.216
	$/mt.	$ 698.86	$ 12,676.45	$ 2,272.94	$ 2,050.28	$ 815.70	$ 476.19

10.4.3 **Replacement Tables and Figures**

Product prices and quantities produced are integral components of many of the tables found in Chapters 4-6. It is impractical, and perhaps misleading, to retool the original document with the updated information. Therefore, this section presents a set of "replacement tables" and a "replacement figure" which may be used to assess the impacts of the inshore offshore allocation with the "best available data." For each of the "replacements," the original table and page number is included in the header at the top of the page. We have chosen to renumber the replacement tables with new numbers consistent with their placement here in Chapter 10.

Replacement for Figure 4.1b on page 120.

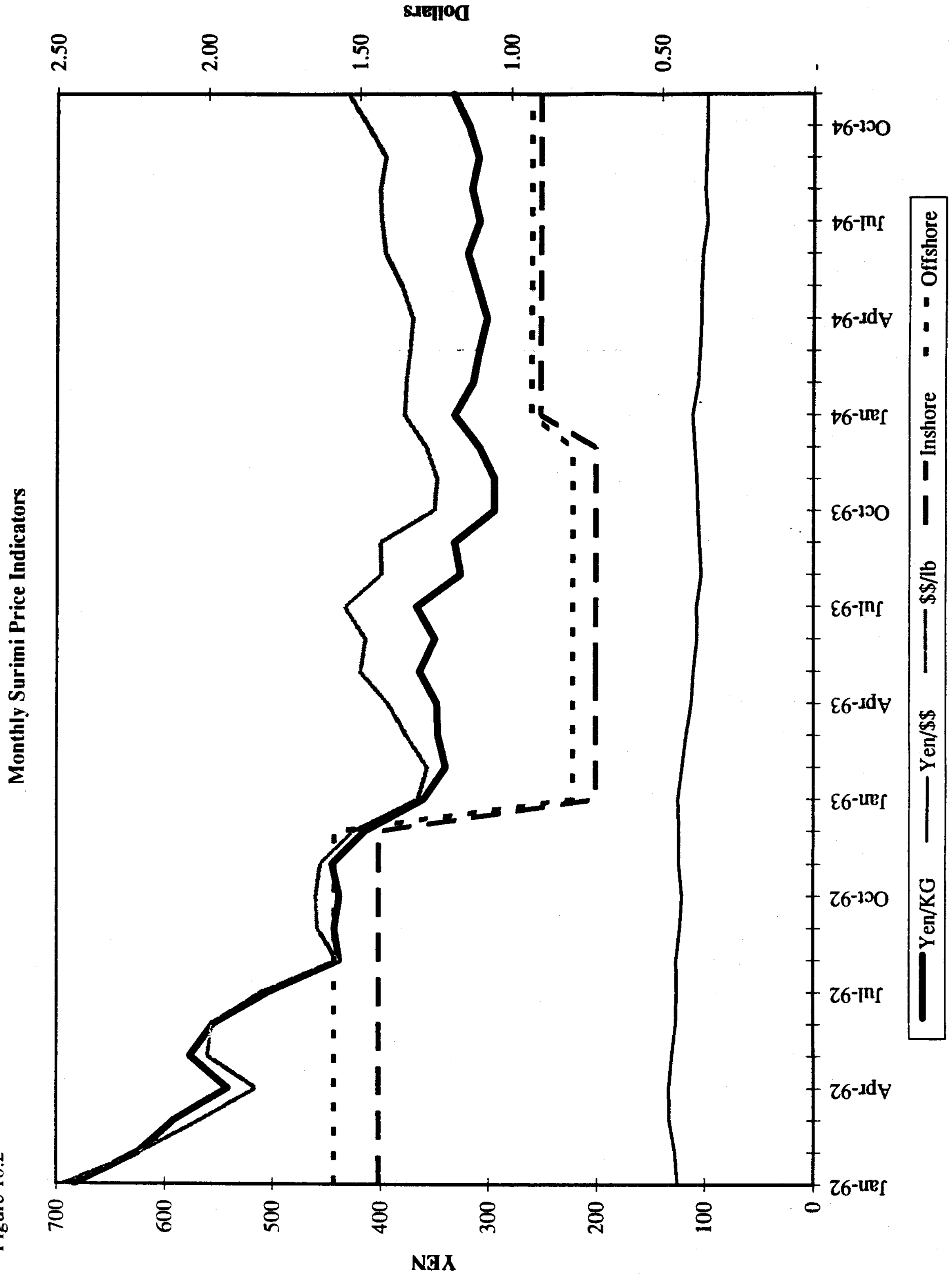

Figure 10.2

Replacement for Tables 4.1a and 4.1b on page 122.

Table 10.6

Product Prices For Pollock 1991-1994								
Year	Sector	Units	H & G	Roe	Fillets	Surimi	Minced	Meal/Oil
1991	Inshore	$/lb.	$ 0.263	$ 3.748	$ 1.336	$ 1.266	$ 0.701	$ 0.218
		$/mt.	$ 580.19	$ 8,262.84	$ 2,945.10	$ 2,791.02	$ 1,545.42	$ 481.39
	Offshore	$/lb.	$ 0.367	$ 4.649	$ 1.361	$ 1.576	$ 0.710	$ 0.250
		$/mt.	$ 809.15	$ 10,249.19	$ 3,001.15	$ 3,474.45	$ 1,565.27	$ 551.15
1992	Inshore	$/lb.	$ 0.499	$ 4.281	$ 1.209	$ 1.435	$ 0.383	$ 0.205
		$/mt.	$ 1,100.30	$ 9,437.89	$ 2,664.91	$ 3,163.60	$ 844.36	$ 452.32
	Offshore	$/lb.	$ 0.284	$ 5.509	$ 1.217	$ 1.581	$ 0.521	$ 0.245
		$/mt.	$ 625.83	$ 12,145.14	$ 2,682.77	$ 3,485.47	$ 1,148.60	$ 540.13
1993	Inshore	$/lb.	$ 0.344	$ 3.607	$ 1.035	$ 0.718	$ 0.393	$ 0.195
		$/mt.	$ 757.84	$ 7,951.99	$ 2,281.92	$ 1,582.90	$ 866.41	$ 429.21
	Offshore	$/lb.	$ 0.128	$ 5.119	$ 1.130	$ 0.798	$ 0.391	$ 0.223
		$/mt.	$ 283.09	$ 11,285.35	$ 2,491.39	$ 1,759.27	$ 862.00	$ 491.63
1994	Inshore	$/lb.	$ 0.486	$ 3.941	$ 0.942	$ 0.900	$ 0.430	$ 0.192
		$/mt.	$ 1,071.44	$ 8,688.33	$ 2,076.73	$ 1,984.14	$ 947.98	$ 423.28
	Offshore	$/lb.	$ 0.317	$ 5.750	$ 1.031	$ 0.930	$ 0.370	$ 0.216
		$/mt.	$ 698.86	$ 12,676.45	$ 2,272.94	$ 2,050.28	$ 815.70	$ 476.19

Table 10.7

Product Prices For Pacific Cod 1991-1994									
Year	Sector	Units	Whole	H & G	Fillets	Roe	Other	Minced	Meal/Oil
1991	Inshore	$/lb.	$ 0.551	$ 0.796	$ 1.922	$ 0.722	$ 1.045	$ 0.647	$ 0.217
		$/mt.	$ 1,214.97	$ 1,755.52	$ 4,238.07	$ 1,591.72	$ 2,303.80	$ 1,425.88	$ 477.89
	Offshore	$/lb.	$ 0.433	$ 0.925	$ 2.239	$ 0.857	$ 0.557	$ 0.695	$ 0.297
		$/mt.	$ 955.26	$ 2,039.15	$ 4,935.04	$ 1,889.34	$ 1,227.71	$ 1,532.20	$ 654.74
1992	Inshore	$/lb.	$ 0.465	$ 0.779	$ 1.808	$ 0.758	$ 1.252	$ 0.676	$ 0.231
		$/mt.	$ 1,025.58	$ 1,716.73	$ 3,986.89	$ 1,671.09	$ 2,761.23	$ 1,489.39	$ 509.91
	Offshore	$/lb.	$ 0.399	$ 0.761	$ 2.038	$ 1.050	$ 0.858	$ 0.689	$ 0.232
		$/mt.	$ 880.49	$ 1,677.46	$ 4,492.31	$ 2,314.83	$ 1,891.74	$ 1,519.84	$ 511.47
1993	Inshore	$/lb.	$ 0.431	$ 0.492	$ 1.425	$ 0.829	$ 1.227	$ 0.372	$ 0.200
		$/mt.	$ 950.07	$ 1,083.82	$ 3,140.99	$ 1,827.61	$ 2,705.35	$ 819.28	$ 441.43
	Offshore	$/lb.	$ 0.408	$ 0.745	$ 1.726	$ 0.989	$ 1.068	$ 0.369	$ 0.197
		$/mt.	$ 898.49	$ 1,642.49	$ 3,804.87	$ 2,180.35	$ 2,354.84	$ 813.50	$ 434.31
1994	Inshore	$/lb.	$ 0.432	$ 0.713	$ 1.433	$ 0.688	$ 1.702	$ 0.338	$ 0.203
		$/mt.	$ 952.40	$ 1,571.30	$ 3,159.30	$ 1,515.63	$ 3,751.96	$ 745.94	$ 448.28
	Offshore	$/lb.	$ 0.298	$ 0.778	$ 1.677	$ 0.772	$ 1.504	$ 0.751	$ 0.244
		$/mt.	$ 657.55	$ 1,716.16	$ 3,696.90	$ 1,701.74	$ 3,315.92	$ 1,654.97	$ 537.10

Replacement for Table 4.2 on page 124.

Table 10.8

Prices of Primary Pollock Products by Sector and Year	1991	1992	1993	1994	Supplemental
Inshore Roe	$ 3.748	$ 4.281	$ 3.607	$ 3.941	$ 3.790
Inshore Fillets	$ 1.336	$ 1.209	$ 1.035	$ 0.942	$ 1.490
Inshore Surimi	$ 1.266	$ 1.435	$ 0.718	$ 0.900	$ 1.365
Offshore Roe	$ 4.649	$ 5.509	$ 5.119	$ 5.750	$ 5.125
Offshore Fillets	$ 1.361	$ 1.217	$ 1.130	$ 1.031	$ 1.350
Offshore Surimi	$ 1.576	$ 1.581	$ 0.798	$ 0.930	$ 1.535

Difference in Prices of Primary Products From Supplemental Prices	1991	1992	1993	1994	Supplemental
Inshore Roe	$ (0.042)	$ 0.491	$ (0.183)	$ 0.151	$ -
Inshore Fillets	$ (0.154)	$ (0.281)	$ (0.455)	$ (0.548)	$ -
Inshore Surimi	$ (0.099)	$ 0.070	$ (0.647)	$ (0.465)	$ -
Offshore Roe	$ (0.476)	$ 0.384	$ (0.006)	$ 0.625	$ -
Offshore Fillets	$ 0.011	$ (0.133)	$ (0.220)	$ (0.319)	$ -
Offshore Surimi	$ 0.041	$ 0.046	$ (0.737)	$ (0.605)	$ -

Sector Prices of Pollock Products as a Percent of 1991Prices	1991	1992	1993	1994	Supplemental
Inshore Roe	100.00%	114.22%	96.24%	105.15%	101.12%
Inshore Fillets	100.00%	90.49%	77.48%	70.51%	111.54%
Inshore Surimi	100.00%	113.35%	56.71%	71.09%	107.82%
Offshore Roe	100.00%	118.50%	110.11%	123.68%	110.24%
Offshore Fillets	100.00%	89.39%	83.01%	75.74%	99.17%
Offshore Surimi	100.00%	100.32%	50.63%	59.01%	97.40%

Sector Prices of Pollock Products as a Percent of Sector Surimi Price	1991	1992	1993	1994	Supplemental
Inshore Roe	296.05%	298.33%	502.37%	437.89%	277.66%
Inshore Fillets	105.52%	84.24%	144.16%	104.67%	109.16%
Inshore Surimi	100.00%	100.00%	100.00%	100.00%	100.00%
Offshore Roe	294.99%	348.45%	641.48%	618.28%	333.88%
Offshore Fillets	86.38%	76.97%	141.61%	110.86%	87.95%
Offshore Surimi	100.00%	100.00%	100.00%	100.00%	100.00%

Offshore Prices of Pollock Products as a Percent of Inshore Prices	1991	1992	1993	1994	Supplemental
Roe	124.04%	128.68%	141.92%	145.90%	135.22%
Fillets	101.90%	100.67%	109.18%	109.45%	90.60%
Surimi	124.49%	110.17%	111.14%	103.33%	112.45%

Replacement for Table 4.3 on page 125.

Table 10.9

Prices of Primary Pacific Cod Products by Sector and Year		1991		1992		1993		1994		SEIS
Inshore Whole	$	0.551	$	0.465	$	0.431	$	0.432	$	0.520
Inshore H&G	$	0.796	$	0.779	$	0.492	$	0.713	$	0.520
Inshore Fillets	$	1.922	$	1.808	$	1.425	$	1.433	$	1.730
Offshore Whole	$	0.433	$	0.399	$	0.408	$	0.298	$	0.520
Offshore H&G	$	0.925	$	0.761	$	0.745	$	0.778	$	0.520
Offshore Fillets	$	2.239	$	2.038	$	1.726	$	1.677	$	1.850

Difference in Prices of Primary Products From SEIS Prices		1991		1992		1993		1994		SEIS
Inshore Whole	$	0.031	$	(0.055)	$	(0.089)	$	(0.088)	$	-
Inshore H&G	$	0.276	$	0.259	$	(0.028)	$	0.193	$	-
Inshore Fillets	$	0.192	$	0.078	$	(0.305)	$	(0.297)	$	-
Offshore Whole	$	(0.087)	$	(0.121)	$	(0.112)	$	(0.222)	$	-
Offshore H&G	$	0.405	$	0.241	$	0.225	$	0.258	$	-
Offshore Fillets	$	0.389	$	0.188	$	(0.124)	$	(0.173)	$	-

Sector Prices of Cod Products as a Percent of 1991Prices	1991	1992	1993	1994	SEIS
Inshore Whole	100.00%	84.41%	78.20%	78.39%	94.36%
Inshore H&G	100.00%	97.79%	61.74%	89.54%	65.30%
Inshore Fillets	100.00%	94.07%	74.11%	74.54%	89.99%
Offshore Whole	100.00%	92.17%	94.06%	68.77%	120.01%
Offshore H&G	100.00%	82.26%	80.55%	84.11%	56.22%
Offshore Fillets	100.00%	91.03%	77.10%	74.92%	82.64%

Sector Prices of Cod Products as a Percent of Sector Fillet Price	1991	1992	1993	1994	SEIS
Inshore Whole	28.67%	25.72%	30.25%	30.15%	30.06%
Inshore H&G	41.42%	43.06%	34.51%	49.76%	30.06%
Inshore Fillets	100.00%	100.00%	100.00%	100.00%	100.00%
Offshore Whole	19.36%	19.60%	23.61%	17.77%	28.11%
Offshore H&G	41.32%	37.34%	43.17%	46.39%	28.11%
Offshore Fillets	100.00%	100.00%	100.00%	100.00%	100.00%

Offshore Prices of Cod Products as a Percent of Inshore Prices	1991	1992	1993	1994	SEIS
Whole	78.62%	85.85%	94.57%	68.98%	100.00%
H&G	116.16%	97.71%	151.55%	109.12%	100.00%
Fillets	116.45%	112.68%	121.14%	117.03%	106.94%

Replacement for Table 4.10 on page 135.

Table 10.10

		Gulf of Alaska Pacific Cod Processed Products							
		Whole	H & G	Fillets	Roe	Other	Minced	Meal/Oil	Total
1991	Inshore	10,752	6,877	9,908	763	428	1,402	233	30,362
	% of Sector Products	35.41%	22.65%	32.63%	2.51%	1.41%	4.62%	0.77%	100.00%
	% of Gulf Product	83.94%	65.33%	92.81%	96.45%	99.43%	97.51%	70.80%	82.06%
	Offshore	2,057	3,649	767	28	2	36	96	6,636
	% of Sector Products	31.00%	54.99%	11.56%	0.42%	0.04%	0.54%	1.45%	100.00%
	% of Gulf Product	16.06%	34.67%	7.19%	3.55%	0.57%	2.49%	29.20%	17.94%
	GOA Total	12,809	10,527	10,675	791	430	1,438	329	36,998
	% of Gulf Total	34.62%	28.45%	28.85%	2.14%	1.16%	3.89%	0.89%	100.00%
1992	Inshore	8,143	3,041	9,462	1,150	722	1,034	432	23,983
	% of Sector Products	33.95%	12.68%	39.45%	4.79%	3.01%	4.31%	1.80%	100.00%
	% of Gulf Product	86.55%	27.65%	97.32%	91.55%	93.12%	99.72%	97.11%	71.29%
	Offshore	1,265	7,957	260	106	53	3	13	9,658
	% of Sector Products	13.10%	82.39%	2.69%	1.10%	0.55%	0.03%	0.13%	100.00%
	% of Gulf Product	13.45%	72.35%	2.68%	8.45%	6.88%	0.28%	2.89%	28.71%
	GOA Total	9,409	10,998	9,722	1,256	775	1,037	445	33,641
	% of Sector Products	27.97%	32.69%	28.90%	3.73%	2.30%	3.08%	1.32%	100.00%
1993	Inshore	8,307	4,215	6,726	1,037	570	444	0	21,298
	% of Sector Products	39.00%	19.79%	31.58%	4.87%	2.67%	2.08%	0.00%	100.00%
	% of Gulf Product	99.86%	91.58%	99.88%	99.72%	100.00%	99.85%	100.00%	98.11%
	Offshore	12	388	8	3	-	1	-	411
	% of Sector Products	2.93%	94.31%	1.90%	0.71%	0.00%	0.17%	0.00%	100.00%
	% of Gulf Product	0.14%	8.42%	0.12%	0.28%	0.00%	0.15%	0.00%	1.89%
	GOA Total	8,319	4,603	6,734	1,040	570	444	0	21,710
	% of Gulf Total	38.32%	21.20%	31.02%	4.79%	2.62%	2.05%	0.00%	100.00%
1994	Inshore	3,435	2,835	6,638	1,060	440	937	159	15,504
	% of Sector Products	22.16%	18.29%	42.81%	6.84%	2.84%	6.04%	1.02%	100.00%
	% of Gulf Product	97.53%	88.76%	99.96%	99.88%	99.39%	100.00%	100.00%	97.16%
	Offshore	87	359	3	1	3	-	-	453
	% of Sector Products	19.23%	79.33%	0.56%	0.29%	0.59%	0.00%	0.00%	100.00%
	% of Gulf Product	2.47%	11.24%	0.04%	0.12%	0.61%	0.00%	0.00%	2.84%
	GOA Total	3,522	3,194	6,640	1,062	442	937	159	15,957
	% of Gulf Total	22.08%	20.02%	41.61%	6.65%	2.77%	5.87%	1.00%	100.00%

Replacement for Table 4.11 on page 137.

Table 10.11

Prices of Primary Pacific Cod Products by Sector and Year	1991	1992	1993	1994	SEIS
Inshore Whole	$ 0.551	$ 0.465	$ 0.431	$ 0.432	$ 0.520
Inshore H&G	$ 0.796	$ 0.779	$ 0.492	$ 0.713	$ 0.520
Inshore Fillets	$ 1.922	$ 1.808	$ 1.425	$ 1.433	$ 1.730
Offshore Whole	$ 0.433	$ 0.399	$ 0.408	$ 0.298	$ 0.520
Offshore H&G	$ 0.925	$ 0.761	$ 0.745	$ 0.778	$ 0.520
Offshore Fillets	$ 2.239	$ 2.038	$ 1.726	$ 1.677	$ 1.850

Difference in Prices of Primary Products From SEIS Prices	1991	1992	1993	1994	SEIS
Inshore Whole	$ 0.031	$ (0.055)	$ (0.089)	$ (0.088)	$ -
Inshore H&G	$ 0.276	$ 0.259	$ (0.028)	$ 0.193	$ -
Inshore Fillets	$ 0.192	$ 0.078	$ (0.305)	$ (0.297)	$ -
Offshore Whole	$ (0.087)	$ (0.121)	$ (0.112)	$ (0.222)	$ -
Offshore H&G	$ 0.405	$ 0.241	$ 0.225	$ 0.258	$ -
Offshore Fillets	$ 0.389	$ 0.188	$ (0.124)	$ (0.173)	$ -

Sector Prices of Cod Products as a Percent of 1991Prices	1991	1992	1993	1994	SEIS
Inshore Whole	100.00%	84.41%	78.20%	78.39%	94.36%
Inshore H&G	100.00%	97.79%	61.74%	89.54%	65.30%
Inshore Fillets	100.00%	94.07%	74.11%	74.54%	89.99%
Offshore Whole	100.00%	92.17%	94.06%	68.77%	120.01%
Offshore H&G	100.00%	82.26%	80.55%	84.11%	56.22%
Offshore Fillets	100.00%	91.03%	77.10%	74.92%	82.64%

Sector Prices of Cod Products as a Percent of Sector Fillet Price	1991	1992	1993	1994	SEIS
Inshore Whole	28.67%	25.72%	30.25%	30.15%	30.06%
Inshore H&G	41.42%	43.06%	34.51%	49.76%	30.06%
Inshore Fillets	100.00%	100.00%	100.00%	100.00%	100.00%
Offshore Whole	19.36%	19.60%	23.61%	17.77%	28.11%
Offshore H&G	41.32%	37.34%	43.17%	46.39%	28.11%
Offshore Fillets	100.00%	100.00%	100.00%	100.00%	100.00%

Offshore Prices of Cod Products as a Percent of Inshore Prices	1991	1992	1993	1994	SEIS
Whole	78.62%	85.85%	94.57%	68.98%	100.00%
H&G	116.16%	97.71%	151.55%	109.12%	100.00%
Fillets	116.45%	112.68%	121.14%	117.03%	106.94%

Replacement for Table 4.12 on page 138.

Table 10.12

Gulf of Alaska Pacific Cod Gross Revenue								
	Whole	H & G	Fillets	Roe	Other	Minced	Meal/Oil	Total
1991 Inshore	$ 13,063,400	$ 12,073,403	$ 41,989,940	$ 1,213,687	$ 985,104	$ 1,998,792	$ 111,300	$ 71,435,626
% of Sector Products	18.29%	16.90%	58.78%	1.70%	1.38%	2.80%	0.16%	100.00%
% of Gulf Product	86.92%	61.87%	91.73%	95.81%	99.70%	97.33%	63.89%	84.24%
Offshore	$ 1,965,153	$ 7,441,056	$ 3,786,554	$ 53,072	$ 2,996	$ 54,745	$ 62,894	$ 13,366,471
% of Sector Products	14.70%	55.67%	28.33%	0.40%	0.02%	0.41%	0.47%	100.00%
% of Gulf Product	13.08%	38.13%	8.27%	4.19%	0.30%	2.67%	36.11%	15.76%
GOA Total	$ 15,028,553	$ 19,514,460	$ 45,776,494	$ 1,266,759	$ 988,099	$ 2,053,537	$ 174,194	$ 84,802,097
% of Gulf Total	17.72%	23.01%	53.98%	1.49%	1.17%	2.42%	0.21%	100.00%
1992 Inshore	$ 8,351,689	$ 5,220,246	$ 37,721,997	$ 1,921,081	$ 1,992,254	$ 1,540,031	$ 220,376	$ 56,967,675
% of Sector Products	14.66%	9.16%	66.22%	3.37%	3.50%	2.70%	0.39%	100.00%
% of Gulf Product	88.23%	28.12%	96.99%	88.66%	95.18%	99.72%	97.10%	78.09%
Offshore	$ 1,114,173	$ 13,347,211	$ 1,169,035	$ 245,650	$ 100,886	$ 4,347	$ 6,577	$ 15,987,879
% of Sector Products	6.97%	83.48%	7.31%	1.54%	0.63%	0.03%	0.04%	100.00%
% of Gulf Product	11.77%	71.88%	3.01%	11.34%	4.82%	0.28%	2.90%	21.91%
GOA Total	$ 9,465,862	$ 18,567,457	$ 38,891,031	$ 2,166,731	$ 2,093,141	$ 1,544,377	$ 226,954	$ 72,955,554
% of Sector Products	12.97%	25.45%	53.31%	2.97%	2.87%	2.12%	0.31%	100.00%
1993 Inshore	$ 7,892,031	$ 4,568,630	$ 21,125,560	$ 1,895,637	$ 1,540,967	$ 363,483	$ 49	$ 37,386,356
% of Sector Products	21.11%	12.22%	56.51%	5.07%	4.12%	0.97%	0.00%	100.00%
% of Gulf Product	99.86%	87.77%	99.86%	99.67%	100.00%	99.85%	100.00%	98.20%
Offshore	$ 10,809	$ 636,744	$ 29,640	$ 6,345	$ -	$ 553	$ -	$ 684,091
% of Sector Products	1.58%	93.08%	4.33%	0.93%	0.00%	0.08%	0.00%	100.00%
% of Gulf Product	0.14%	12.23%	0.14%	0.33%	0.00%	0.15%	0.00%	1.80%
GOA Total	$ 7,902,840	$ 5,205,374	$ 21,155,200	$ 1,901,982	$ 1,540,967	$ 364,036	$ 49	$ 38,070,447
% of Gulf Total	20.76%	13.67%	55.57%	5.00%	4.05%	0.96%	0.00%	100.00%
1994 Inshore	$ 3,271,875	$ 4,454,950	$ 20,970,486	$ 1,606,871	$ 1,649,699	$ 698,901	$ 71,218	$ 32,724,000
% of Sector Products	10.00%	13.61%	64.08%	4.91%	5.04%	2.14%	0.22%	100.00%
% of Gulf Product	98.28%	87.85%	99.96%	99.86%	99.46%	100.00%	100.00%	97.92%
Offshore	$ 57,220	$ 616,119	$ 9,427	$ 2,246	$ 8,887	$ -	$ -	$ 693,899
% of Sector Products	8.25%	88.79%	1.36%	0.32%	1.28%	0.00%	0.00%	100.00%
% of Gulf Product	1.72%	12.15%	0.04%	0.14%	0.54%	0.00%	0.00%	2.08%
GOA Total	$ 3,329,095	$ 5,071,068	$ 20,979,913	$ 1,609,117	$ 1,658,586	$ 698,901	$ 71,218	$ 33,417,898
% of Gulf Total	9.96%	15.17%	62.78%	4.82%	4.96%	2.09%	0.21%	100.00%

Replacement for Table 4.13 on page 139.

Table 10.13

Gulf of Alaska Pacific Cod Gross Reveue per MT. of Total Catch			
	Gross Revenue	Total Catch	Gross Revenue per MT. of Total Catch
1991			
Inshore Gross Revenue	$ 71,435,626	62,318	$ 1,146.31
Offshore Gross Revenue	$ 13,366,471	14,010	$ 954.06
GOA Gross Revenue	$ 84,802,097	76,328	$ 1,111.02
1992			
Inshore Gross Revenue	$ 56,967,675	58,716	$ 970.23
Offshore Gross Revenue	$ 15,987,879	21,366	$ 748.29
GOA Gross Revenue	$ 72,955,554	80,081	$ 911.02
1993			
Inshore Gross Revenue	$ 37,386,356	54,335	$ 688.07
Offshore Gross Revenue	$ 684,091	2,146	$ 318.74
GOA Gross Revenue	$ 38,070,447	56,481	$ 674.04
1994			
Inshore Gross Revenue	$ 32,724,000	46,502	$ 703.70
Offshore Gross Revenue	$ 693,899	1,593	$ 435.71
GOA Gross Revenue	$ 33,417,898	48,095	$ 694.83

Replacement for Table 4.16 on page 148.

Table 10.14

1991-1994 Processed Product by Sector of GOA Pollock

Sector		H & G	Roe	Fillets	Surimi	Minced	Meal/Oil	Total Product
1991								
Inshore	Tons	11	100	6,097	6,221	1,584	1,922	17,422
	% of Sector Total Product	0.07%	0.57%	34.99%	35.70%	9.09%	11.03%	100.00%
	% of GOA Total	2.90%	32.83%	91.64%	78.38%	97.96%	40.96%	82.30%
Offshore	Tons	382	204	556	1,716	33	573	3,746
	% of Sector Total Product	10.19%	5.44%	14.85%	45.80%	0.88%	15.28%	100.00%
	% of GOA Total	97.10%	67.17%	8.36%	21.62%	2.04%	12.20%	17.70%
GOA Total	Tons	393	303	6,653	7,936	1,617	4,691	21,168
	% of GOA Total	1.86%	1.43%	31.43%	37.49%	7.64%	22.16%	100.00%
1992								
Inshore	Tons	634	268	6,487	7,312	996	1,023	18,124
	% of Sector Total Product	3.50%	1.48%	35.79%	40.35%	5.50%	5.64%	100.00%
	% of GOA Total	81.81%	96.19%	99.27%	92.60%	100.00%	5.37%	95.21%
Offshore	Tons	141	11	48	584	0	123	912
	% of Sector Total Product	15.46%	1.17%	5.23%	64.08%	0.00%	13.44%	100.00%
	% of GOA Total	18.19%	3.81%	0.73%	7.40%	0.00%	0.64%	4.79%
GOA Total	Tons	775	279	6,535	7,896	996	2,235	19,035
	% of GOA Total	4.07%	1.47%	34.33%	41.48%	5.23%	11.74%	100.00%
1993								
Inshore	Tons	431	434	11,481	6,049	3,181	1,510	23,085
	% of Sector Total Product	1.87%	1.88%	49.73%	26.20%	13.78%	6.54%	100.00%
	% of GOA Total	1.87%	1.88%	49.73%	26.20%	13.78%	6.54%	100.00%
1994								
Inshore	Tons	56	1,083	10,302	9,003	1,281	1,136	23,042
	% of Sector Total Product	0.24%	4.70%	44.71%	39.07%	5.56%	4.93%	100.00%
	% of GOA Total	0.24%	4.70%	44.71%	39.07%	5.56%	4.93%	100.00%

Replacement for Table 4.17 on page 149.

Table 10.15

Production and Total Catch of Pollock in the GOA in 1991			
		Total Product	Total Catch
Inshore	Tons	17,422	77,162
	Product/Totals (PRR)	22.58%	
Offshore	Tons	3,746	23,325
	Product/Totals (PRR)	16.06%	
Total	Tons	21,168	100,487
	% of GOA Total	21.07%	

Production and Total Catch of Pollock in the GOA in 1992			
		Total Product	Total Catch
Inshore	Tons	18,124	86,719
	Product/Totals (PRR)	20.90%	
Offshore	Tons	912	6,733
	Product/Totals (PRR)	13.54%	
Total	Tons	19,035	93,453
	% of GOA Total	20.37%	

Production and Total Catch of Pollock in the GOA in 1993			
		Total Product	Total Catch
Inshore	Tons	23,085	107,951
	Product/Totals (PRR)	21.38%	

Production and Total Catch of Pollock in the GOA in 1994			
		Total Product	Total Catch
Inshore	Tons	23,042	109,411
	Product/Totals (PRR)	21.06%	

Replacement for Table 4.18 on page 150.

Table 10.16

Year	Sector	Units	H & G	Roe	Fillets	Surimi	Minced	Meal/Oil
			Product Prices For Pollock 1991-1994					
1991	Inshore	$/lb.	$ 0.263	$ 3.748	$ 1.336	$ 1.266	$ 0.701	$ 0.218
		$/mt.	$ 580.19	$ 8,262.84	$ 2,945.10	$ 2,791.02	$ 1,545.42	$ 481.39
	Offshore	$/lb.	$ 0.367	$ 4.649	$ 1.361	$ 1.576	$ 0.710	$ 0.250
		$/mt.	$ 809.15	$ 10,249.19	$ 3,001.15	$ 3,474.45	$ 1,565.27	$ 551.15
1992	Inshore	$/lb.	$ 0.499	$ 4.281	$ 1.209	$ 1.435	$ 0.383	$ 0.205
		$/mt.	$ 1,100.30	$ 9,437.89	$ 2,664.91	$ 3,163.60	$ 844.36	$ 452.32
	Offshore	$/lb.	$ 0.284	$ 5.509	$ 1.217	$ 1.581	$ 0.521	$ 0.245
		$/mt.	$ 625.83	$ 12,145.14	$ 2,682.77	$ 3,485.47	$ 1,148.60	$ 540.13
1993	Inshore	$/lb.	$ 0.344	$ 3.607	$ 1.035	$ 0.718	$ 0.393	$ 0.195
		$/mt.	$ 757.84	$ 7,951.99	$ 2,281.92	$ 1,582.90	$ 866.41	$ 429.21
	Offshore	$/lb.	$ 0.128	$ 5.119	$ 1.130	$ 0.798	$ 0.391	$ 0.223
		$/mt.	$ 283.09	$ 11,285.35	$ 2,491.39	$ 1,759.27	$ 862.00	$ 491.63
1994	Inshore	$/lb.	$ 0.486	$ 3.941	$ 0.942	$ 0.900	$ 0.430	$ 0.192
		$/mt.	$ 1,071.44	$ 8,688.33	$ 2,076.73	$ 1,984.14	$ 947.98	$ 423.28
	Offshore	$/lb.	$ 0.317	$ 5.750	$ 1.031	$ 0.930	$ 0.370	$ 0.216
		$/mt.	$ 698.86	$ 12,676.45	$ 2,272.94	$ 2,050.28	$ 815.70	$ 476.19

Replacement for Table 4.19 on page 151.

Table 10.17

Gross Revenue of GOA Pollock in 1991 by Sector								
Sector		H & G	Roe	Fillets	Surimi	Minced	Meal/Oil	Total Gr. Revenue
Inshore	Tons	$ 6,614	$ 823,227	$ 17,955,614	$ 17,361,786	$ 2,447,999	$ 925,027	$ 39,520,267
	% of Sector Total Product	0.02%	2.08%	45.43%	43.93%	6.19%	2.34%	100.00%
	% of GOA Total	2.10%	28.27%	91.49%	74.44%	97.93%	19718.25%	79.17%
Offshore	Tons	$ 308,893	$ 2,089,194	$ 1,670,018	$ 5,961,113	$ 51,669	$ 315,561	$ 10,396,449
	% of Sector Total Product	2.97%	20.10%	16.06%	57.34%	0.50%	3.04%	100.00%
	% of GOA Total	97.90%	71.73%	8.51%	25.56%	2.07%	6726.63%	20.83%
GOA Total	Tons	315,508	2,912,421	19,625,632	23,322,899	2,499,668	4,691	49,916,716
	% of GOA Total	0.63%	5.83%	39.32%	46.72%	5.01%	0.01%	100.00%

Gross Revenue of GOA Pollock in 1992 by Sector								
Sector		H & G	Roe	Fillets	Surimi	Minced	Meal/Oil	Total Gr. Revenue
Inshore	Tons	$ 697,742	$ 2,533,036	$ 17,286,946	$ 23,133,136	$ 840,917	$ 462,539	$ 44,954,317
	% of Sector Total Product	1.55%	5.63%	38.45%	51.46%	1.87%	1.03%	100.00%
	% of GOA Total	88.77%	95.15%	99.27%	91.91%	99.99%	0.98%	94.84%
Offshore	Tons	$ 88,230	$ 129,103	$ 127,834	$ 2,036,213	$ 46	$ 66,193	$ 2,447,618
	% of Sector Total Product	3.60%	5.27%	5.22%	83.19%	0.00%	2.70%	100.00%
	% of GOA Total	11.23%	4.85%	0.73%	8.09%	0.01%	0.14%	5.16%
GOA Total	Tons	785,972	2,662,139	17,414,780	25,169,349	840,963	2,235	47,401,935
	% of GOA Total	1.66%	5.62%	36.74%	53.10%	1.77%	0.00%	100.00%

Gross Revenue of GOA Pollock in 1993 by Sector								
Sector		H & G	Roe	Fillets	Surimi	Minced	Meal/Oil	Total Gr. Revenue
Inshore	Tons	$ 326,478	$ 3,447,984	$ 26,197,731	$ 9,574,789	$ 2,756,061	$ 648,126	$ 42,951,168
	% of Sector Total Product	0.76%	8.03%	60.99%	22.29%	6.42%	1.51%	100.00%
	% of GOA Total	0.76%	8.03%	60.99%	22.29%	6.42%	1.51%	100.00%

Gross Revenue of GOA Pollock in 1994 by Sector								
Sector		H & G	Roe	Fillets	Surimi	Minced	Meal/Oil	Total Gr. Revenue
Inshore	Tons	$ 59,668	$ 9,412,935	$ 21,394,755	$ 17,862,895	$ 1,214,113	$ 480,812	$ 50,425,178
	% of Sector Total Product	0.12%	18.67%	42.43%	35.42%	2.41%	0.95%	100.00%
	% of GOA Total	0.12%	18.67%	42.43%	35.42%	2.41%	0.95%	100.00%

Replacement for Table 4.20 on page 152.

Table 10.18

1991 GOA Gross Revenue per Ton of Catch by Sector			
		Gross Revenue	Total Catch
Inshore	$	39,520,267	77,162
Gross Revenue/Total Tons	$	512.17	
Offshore	$	10,396,449	23,325
Gross Revenue/Total Tons	$	445.72	
Total	$	49,916,716	100,487
Gross Revenue/Total Tons	$	496.75	

1992 GOA Gross Revenue per Ton of Catch by Sector			
		Gross Revenue	Total Catch
Inshore	$	44,954,317	86,719
Gross Revenue/Total Tons	$	518.39	
Offshore	$	2,447,618	6,733
Gross Revenue/Total Tons	$	363.51	
Total	$	47,401,935	93,453
Gross Revenue/Total Tons	$	507.23	

1993 GOA Gross Revenue per Ton of Catch by Sector			
		Gross Revenue	Total Catch
Inshore	$	42,951,168	107,951
Gross Revenue/Total Tons	$	397.88	

1994 GOA Gross Revenue per Ton of Catch by Sector			
		Gross Revenue	Total Catch
Inshore	$	50,425,178	109,411
Gross Revenue/Total Tons	$	460.88	

Replacement for Table 4.23 on page 169.

Table 10.19 1991-1994 Processed Product by Sector of BSAI Pollock

1991 Sector		H & G	Roe	Fillets	Surimi	Minced	Meal/Oil	Total Product
Inshore	Tons	31	2,815	11,006	45,171	2,738	26,824	88,585
	% of Class Total Product	0.04%	3.18%	12.42%	50.99%	3.09%	30.28%	100.00%
	% of BSAI Product	1.17%	13.19%	16.80%	34.24%	30.01%	45.13%	30.55%
Offshore	Tons	2,612	18,537	54,517	86,737	6,387	32,611	201,400
	% of Class Total Product	1.30%	9.20%	27.07%	43.07%	3.17%	16.19%	100.00%
	% of BSAI Product	98.83%	86.81%	83.20%	65.76%	69.99%	54.87%	69.45%
BSAI Total	Tons	2,643	21,352	65,523	131,908	9,125	59,435	289,985
	% of BSAI Product	0.91%	7.36%	22.60%	45.49%	3.15%	20.50%	100.00%
1992 Sector		H & G	Roe	Fillets	Surimi	Minced	Meal/Oil	Total Product
Inshore	Tons	-	4,483	9,764	65,115	4,602	37,035	120,999
	% of Sector Total Product	0.00%	3.70%	8.07%	53.81%	3.80%	30.61%	100.00%
	% of BSAI Total	0.00%	25.68%	26.46%	41.47%	33.10%	57.12%	41.26%
Offshore	Tons	3,168	12,971	27,139	91,890	9,300	27,803	172,272
	% of Sector Total Product	1.84%	7.53%	15.75%	53.34%	5.40%	16.14%	100.00%
	% of BSAI Total	100.00%	74.32%	73.54%	58.53%	66.90%	42.88%	58.74%
BSAI Total	Tons	3,168	17,454	36,903	157,005	13,902	64,838	293,270
	% of Total Catch	1.08%	5.95%	12.58%	53.54%	4.74%	22.11%	100.00%
1993 Sector		H & G	Roe	Fillets	Surimi	Minced	Meal/Oil	Total Product
Inshore	Tons	594	1,601	10,556	69,235	3,515	40,661	126,162
	% of Sector Total Product	0.47%	1.27%	8.37%	54.88%	2.79%	32.23%	100.00%
	% of BSAI Total	10.95%	13.99%	18.63%	47.97%	26.60%	63.99%	42.82%
Offshore	Tons	4,825	9,847	46,108	75,103	9,702	22,881	168,466
	% of Sector Total Product	2.86%	5.85%	27.37%	44.58%	5.76%	13.58%	100.00%
	% of BSAI Total	89.05%	86.01%	81.37%	52.03%	73.40%	36.01%	57.18%
BSAI Total	Tons	5,418	11,449	56,664	144,339	13,217	63,542	294,628
	% of Total Products	1.84%	3.89%	19.23%	48.99%	4.49%	21.57%	100.00%
1994 Sector		H & G	Roe	Fillets	Surimi	Minced	Meal/Oil	Total Product
Inshore	Tons	2	3,309	9,631	79,677	2,686	40,801	136,106
	% of Sector Total Product	0.00%	2.43%	7.08%	58.54%	1.97%	29.98%	100.00%
	% of BSAI Total	0.18%	32.94%	23.37%	48.12%	32.46%	66.81%	47.41%
Offshore	Tons	901	6,737	31,579	85,905	5,589	20,273	150,984
	% of Sector Total Product	0.60%	4.46%	20.92%	56.90%	3.70%	13.43%	100.00%
	% of BSAI Total	99.82%	67.06%	76.63%	51.88%	67.54%	33.19%	52.59%
BSAI Total	Tons	903	10,046	41,210	165,582	8,275	61,074	287,090
	% of Total Products	0.31%	3.50%	14.35%	57.68%	2.88%	21.27%	100.00%

Replacement for Table 4.25 on page 174.

Table 10.20 1991-1994 Gross Revenue by Sector of BSAI Pollock

1991		H & G	Roe	Fillets	Surimi	Minced	Meal/Oil	Gross Revenue
Inshore	Gross Revenue	$ 18,009	$ 23,263,450	$ 32,414,302	$ 126,071,987	$ 4,231,496	$ 12,912,791	$ 198,912,036
	% of InshoreGr. Revenue	0.01%	11.70%	16.30%	63.38%	2.13%	6.49%	100.00%
	% of BSAI Product Gr. Rev.	0.84%	10.91%	16.54%	29.49%	29.74%	41.81%	22.50%
Offshore	Gross Revenue	$ 2,113,697	$ 189,988,022	$ 163,612,255	$ 301,363,335	$ 9,997,119	$ 17,973,354	685,047,783
	% of OffshoreGr. Revenue	0.31%	27.73%	23.88%	43.99%	1.46%	2.62%	100.00%
	% of BSAI Product Gr. Rev.	99.16%	89.09%	83.46%	70.51%	70.26%	58.19%	77.50%
BSAI Total	Gross Revenue	$ 2,131,706	$ 213,251,472	$ 196,026,557	$ 427,435,322	$ 14,228,615	$ 30,886,145	$ 883,959,818
	% of BSAI Gr. Revenue	0.24%	24.12%	22.18%	48.35%	1.61%	3.49%	100.00%

1992		H & G	Roe	Fillets	Surimi	Minced	Meal/Oil	Gross Revenue
Inshore	Gross Revenue	$ -	$ 42,309,789	$ 26,019,654	$ 205,998,195	$ 3,885,381	$ 16,751,705	$ 294,964,725
	% of InshoreGr. Revenue	0.00%	14.34%	8.82%	69.84%	1.32%	5.68%	33.78%
	% of BSAI Product Gr. Rev.	0.00%	21.17%	26.33%	39.14%	26.67%	52.73%	33.78%
Offshore	Gross Revenue	$ 1,982,612	$ 157,540,094	$ 72,808,992	$ 320,278,334	$ 10,682,190	$ 15,017,205	$ 578,309,427
	% of OffshoreGr. Revenue	0.34%	27.24%	12.59%	55.38%	1.85%	2.60%	100.00%
	% of BSAI Product Gr. Rev.	100.00%	78.83%	73.67%	60.86%	73.33%	47.27%	66.22%
BSAI Total	Gross Revenue	$ 1,982,612	$ 199,849,884	$ 98,828,646	$ 526,276,530	$ 14,567,571	$ 31,768,910	$ 873,274,152
	% of BSAI Gr. Revenue	0.23%	22.89%	11.32%	60.26%	1.67%	3.64%	100.00%

1993		H & G	Roe	Fillets	Surimi	Minced	Meal/Oil	Gross Revenue
Inshore	Gross Revenue	$ 449,786	$ 12,734,638	$ 24,087,233	$ 109,592,703	$ 3,045,441	$ 17,452,008	$ 167,361,810
	% of InshoreGr. Revenue	0.27%	7.61%	14.39%	65.48%	1.82%	10.43%	30.63%
	% of BSAI Product Gr. Rev.	24.77%	10.28%	17.33%	45.34%	26.70%	60.81%	100.00%
Offshore	Gross Revenue	$ 1,365,804	$ 111,128,509	$ 114,874,049	$ 132,126,937	$ 8,362,826	$ 11,248,738	$ 379,106,863
	% of OffshoreGr. Revenue	0.36%	29.31%	30.30%	34.85%	2.21%	2.97%	69.37%
	% of BSAI Product Gr. Rev.	75.23%	89.72%	82.67%	54.66%	73.30%	39.19%	69.37%
BSAI Total	Gross Revenue	$ 1,815,591	$ 123,863,147	$ 138,961,283	$ 241,719,640	$ 11,408,267	$ 28,700,746	$ 546,468,673
	% of BSAI Gr. Revenue	0.33%	22.67%	25.43%	44.23%	2.09%	5.25%	100.00%

1994		H & G	Roe	Fillets	Surimi	Minced	Meal/Oil	Gross Revenue
Inshore	Gross Revenue	$ 1,789	$ 28,750,114	$ 20,000,664	$ 158,090,720	$ 2,546,079	$ 17,270,505	$ 226,659,871
	% of InshoreGr. Revenue	0.00%	12.68%	8.82%	69.75%	1.12%	7.62%	41.40%
	% of BSAI Product Gr. Rev.	0.70%	27.44%	20.27%	51.13%	34.58%	63.41%	100.00%
Offshore	Gross Revenue	$ 255,150	$ 76,028,483	$ 78,675,184	$ 151,130,510	$ 4,817,788	$ 9,966,671	$ 320,873,785
	% of OffshoreGr. Revenue	0.08%	23.69%	24.52%	47.10%	1.50%	3.11%	58.60%
	% of BSAI Product Gr. Rev.	99.30%	72.56%	79.73%	48.87%	65.42%	36.59%	58.60%
BSAI Total	Gross Revenue	$ 256,939	$ 104,778,596	$ 98,675,849	$ 309,221,230	$ 7,363,867	$ 27,237,176	$ 547,533,657
	% of BSAI Gr. Revenue	0.05%	19.14%	18.02%	56.48%	1.34%	4.97%	100.00%

Replacement for Table 4.26 on page 175.

Table 10.21

1991 BSAI Gross Revenue per Ton of Total Product			
		Gross Revenue	Total Product
Inshore		$ 198,912,036	88,585
	Revenue/Ton	$ 2,245.43	
Offshore		$ 685,047,783	201,400
	Revenue/Ton	$ 3,401.43	
BSAI Total		$ 883,959,818	289,985
	Revenue/Ton	$ 3,048.29	

1992 BSAI Gross Revenue per Ton of Total Product			
		Gross Revenue	Total Product
Inshore		$ 294,964,725	120,999
	Revenue/Ton	$ 2,437.75	
Offshore		$ 578,309,427	172,272
	Revenue/Ton	$ 3,356.96	
BSAI Total		$ 873,274,152	293,270
	Revenue/Ton	$ 2,977.71	

1993 BSAI Gross Revenue per Ton of Total Product			
		Gross Revenue	Total Product
Inshore		$ 167,361,810	126,162
	Revenue/Ton	$ 1,326.56	
Offshore		$ 379,106,863	168,466
	Revenue/Ton	$ 2,250.35	
BSAI Total		$ 546,468,673	294,628
	Revenue/Ton	$ 1,854.78	

1994 BSAI Gross Revenue per Ton of Total Product			
		Gross Revenue	Total Product
Inshore		$ 226,659,871	136,106
	Revenue/Ton	$ 1,665.32	
Offshore		$ 320,873,785	150,984
	Revenue/Ton	$ 2,125.21	
BSAI Total		$ 547,533,657	287,090
	Revenue/Ton	$ 1,907.18	

Replacement for Table 4.27 on page 177.

Table 10.22

Production and Total Catch of Pollock in the BSAI in 1991			
		Total Product	Total Catch
Inshore	Tons	88,585	407,290
	Product/Total Catch (PRR)	21.75%	
Offshore	Tons	201,400	1,202,980
	Product/Total Catch (PRR)	16.74%	
BSAI Total	Tons	289,985	1,610,270
	Product/Total Catch (PRR)	18.01%	

Production and Total Catch of Pollock in the BSAI in 1992			
		Total Product	Total Catch
Inshore	Tons	120,999	423,167
	Product/Total Catch (PRR)	28.59%	
Offshore	Tons	172,272	1,015,245
	Product/Total Catch (PRR)	16.97%	
BSAI Total	Tons	293,270	1,438,412
	Product/Total Catch (PRR)	20.39%	

Production and Total Catch of Pollock in the BSAI in 1993			
		Total Product	Total Catch
Inshore	Tons	126,162	442,588
	Product/Total Catch (PRR)	28.51%	
Offshore	Tons	168,466	814,474
	Product/Total Catch (PRR)	20.68%	
BSAI Total	Tons	294,628	1,257,062
	Product/Total Catch (PRR)	23.44%	

Production and Total Catch of Pollock in the BSAI in 1994			
		Total Product	Total Catch
Inshore	Tons	136,106	448,243
	Product/Total Catch (PRR)	30.36%	
Offshore	Tons	150,984	833,766
	Product/Total Catch (PRR)	18.11%	
BSAI Total	Tons	287,090	1,282,009
	Product/Total Catch (PRR)	22.39%	

Replacement for Table 4.28 on page .

Table 10.23

1991 BSAI Gross Revenue per Ton of Total Catch		
	Gross Revenue	Total Catch
Inshore	$ 198,912,036	407,290
Revenue/Ton	$ 488.38	
Offshore	$ 685,047,783	1,202,980
Revenue/Ton	$ 569.46	
BSAI Total	$ 883,959,818	1,610,270
Revenue/Ton	$ 548.95	

1992 BSAI Gross Revenue per Ton of Total Catch		
	Gross Revenue	Total Catch
Inshore	$ 294,964,725	423,167
Revenue/Ton	$ 697.04	
Offshore	$ 578,309,427	1,015,245
Revenue/Ton	$ 569.63	
BSAI Total	$ 873,274,152	1,438,412
Revenue/Ton	$ 607.11	

1993 BSAI Gross Revenue per Ton of Total Catch		
	Gross Revenue	Total Catch
Inshore	$ 167,361,810	442,588
Revenue/Ton	$ 378.14	
Offshore	$ 379,106,863	814,474
Revenue/Ton	$ 465.46	
BSAI Total	$ 546,468,673	1,257,062
Revenue/Ton	$ 434.72	

1994 BSAI Gross Revenue per Ton of Total Catch		
	Gross Revenue	Total Catch
Inshore	$ 226,659,871	448,243
Revenue/Ton	$ 505.66	
Offshore	$ 320,873,785	833,766
Revenue/Ton	$ 384.85	
BSAI Total	$ 547,533,657	1,282,009
Revenue/Ton	$ 427.09	

Replacement for Tables 5.6a and 5.6b on page 195.

Table 10.24a

Projected Processed Product of BSAI Pollock by Sector Using Seasonal Averages								
		H & G	Roe	Fillets	Surimi	Minced	Meal/Oil	Total Product
Inshore	Tons	1	2,759	8,031	66,439	2,240	34,022	113,492
	% of Sector Total Product	0.00%	2.43%	7.08%	58.54%	1.97%	29.98%	40.83%
	% of BSAI Total	0.14%	27.32%	18.93%	41.52%	26.89%	60.64%	100.00%
Offshore	Tons	982	7,339	34,400	93,579	6,088	22,084	164,471
	% of Sector Total Product	0.60%	4.46%	20.92%	56.90%	3.70%	13.43%	59.17%
	% of BSAI Total	99.86%	72.68%	81.07%	58.48%	73.11%	39.36%	59.17%
BSAI Total	Tons	983	10,098	42,430	160,017	8,328	56,106	277,963
	% of Total Products	0.35%	3.63%	15.26%	57.57%	3.00%	20.18%	100.00%

Table 10.24b

Projected Gross Revenue From BSAI Pollock Using Seasonal Averages								
		H & G	Roe	Fillets	Surimi	Minced	Meal/Oil	Gross Revenue
Inshore	Gross Revenue	$ 1,492	$ 23,973,257	$ 16,677,536	$ 131,823,805	$ 2,123,046	$ 14,400,995	$ 189,000,131
	% of InshoreGr. Revenue	0.00%	12.68%	8.82%	69.75%	1.12%	7.62%	33.26%
	% of BSAI Product Gr. Rev.	0.22%	20.49%	17.58%	40.73%	29.95%	57.80%	100.00%
Offshore	Gross Revenue	$ 686,145	$ 93,028,561	$ 78,188,324	$ 191,862,222	$ 4,966,265	$ 10,516,138	$ 379,247,655
	% of OffshoreGr. Revenue	0.18%	24.53%	20.62%	50.59%	1.31%	2.77%	66.74%
	% of BSAI Product Gr. Rev.	99.78%	79.51%	82.42%	59.27%	70.05%	42.20%	66.74%
BSAI Total	Gross Revenue	$ 687,637	$ 117,001,818	$ 94,865,861	$ 323,686,027	$ 7,089,311	$ 24,917,133	$ 568,247,786
	% of BSAI Gr. Revenue	0.12%	20.59%	16.69%	56.96%	1.25%	4.38%	100.00%

Replacement for Tables 5.7a and 5.7b on page 196.

Table 10.25a

Projected Processed Product of BSAI Pollock by Sector Using Seasonal Maximums							
	H & G	Roe	Fillets	Surimi	Minced	Meal/Oil	Total Product
Inshore Tons	1	2,410	7,013	58,020	1,956	29,711	99,111
% of Sector Total Product	0.00%	2.43%	7.08%	58.54%	1.97%	29.98%	36.42%
% of BSAI Total	0.12%	23.78%	16.23%	37.08%	23.39%	56.12%	100.00%
Offshore Tons	1,033	7,721	36,193	98,458	6,406	23,235	173,047
% of Sector Total Product	0.60%	4.46%	20.92%	56.90%	3.70%	13.43%	63.58%
% of BSAI Total	99.88%	76.22%	83.77%	62.92%	76.61%	43.88%	63.58%
BSAI Total Tons	1,034	10,131	43,206	156,478	8,362	52,946	272,158
% of Total Products	0.38%	3.72%	15.88%	57.50%	3.07%	19.45%	100.00%

Table 10.25b

Projected Gross Revenue From BSAI Pollock Using Seasonal Maximums							
	H & G	Roe	Fillets	Surimi	Minced	Meal/Oil	Gross Revenue
Inshore Gross Revenue	$ 1,303	$ 20,935,512	$ 14,564,261	$ 115,119,898	$ 1,854,027	$ 12,576,189	$ 165,051,189
% of InshoreGr. Revenue	0.00%	12.68%	8.82%	69.75%	1.12%	7.62%	29.26%
% of BSAI Product Gr. Rev.	0.18%	17.62%	15.04%	36.32%	26.19%	53.20%	100.00%
Offshore Gross Revenue	$ 721,925	$ 97,879,656	$ 82,265,556	$ 201,867,127	$ 5,225,237	$ 11,064,515	$ 399,024,016
% of OffshoreGr. Revenue	0.18%	24.53%	20.62%	50.59%	1.31%	2.77%	70.74%
% of BSAI Product Gr. Rev.	99.82%	82.38%	84.96%	63.68%	73.81%	46.80%	70.74%
BSAI Total Gross Revenue	$ 723,228	$ 118,815,168	$ 96,829,817	$ 316,987,024	$ 7,079,264	$ 23,640,704	$ 564,075,205
% of BSAI Gr. Revenue	0.13%	21.06%	17.17%	56.20%	1.26%	4.19%	100.00%

Replacement for Tables 5.8a and 5.8b on page 197.

Table 10.26a

Projection of Gross Revenue per Ton of Total Catch Using Seasonal Averages				
			Total Product	Total Catch
Inshore	Gross Revenue	$	189,000,131	373,767
	Revenue/Tons	$	505.66	
Offshore	Gross Revenue	$	379,247,655	908,242
	Revenue/Tons	$	417.56	
BSAI Total	Gross Revenue	$	568,247,786	1,282,009
	Revenue/Tons	$	443.25	

Table 10.26b

Projection of Gross Revenue per Ton of Total Catch Using Seasonal Maximums				
			Total Product	Total Catch
Inshore	Gross Revenue	$	165,051,189	326,405
	Revenue/Tons	$	505.66	
Offshore	Gross Revenue	$	399,024,016	955,604
	Revenue/Tons	$	417.56	
BSAI Total	Gross Revenue	$	564,075,205	1,282,009
	Revenue/Tons	$	439.99	

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APPENDICES

Appendix I Pollock fishery pelagic trawl locations and CPUE by season and year (1990-1993)

Appendix II Platform of opportunity sightings of marine mammals by season

Appendix III Observed bottom trawl, pot, and longline locations of the Pacific cod fleet in the Gulf of Alaska (1990-1994)

Appendix IV Pollock and Pacific Cod Processors, 1991-1994

Appendix V An Econometric Examination of the Realtionship Between the Exvessel Price for Walleye Pollock and the Surimi Export Price to Japan (by University of Alaska Fairbanks Department of Economics)

Appendix VI Draft Report on Economic Impacts of the Pollock Community Development Quota Program (by State of Alaska Department of Community and Regional Affairs)

Appendix I

Pollock fishery pelagic trawl locations and catch-per-unit-effort (mt/hour trawled) by season (A, B and CDQ and year (1990-93)

The first figure identifies the various trawl exclusion zones shown on the following charts. Trawl locations are shaded by CPUE. CPUE within a season and year and across all fishery processor types (catcher-processors, motherships, catcher boats) was sorted by quartiles. Trawl locations where CPUE was in the lowest 25% of all season-year data are labeled with open circles. Trawl locations where CPUE was in the upper 25% of all season-year data are labeled with dark-filled circles. Trawl locations where CPUE was in the middle 50% of all season-year data are labeled with two shades of gray circles. Numbers in parentheses indicate the upper value (in mt/hour) of the range.

For instance, in the first plot:

0-25% (16 mt/hr) = the lower 25% of the data, ranging from 0-16 mt pollock/hour;

25-50% (33) = the second quartile of data, ranging from 16-33 mt pollock/hour (33 mt/hour is the median);

50-75% (76) = the third quartile of data, ranging from 33-76 mt pollock/hour;

75-100% (2,300) = the fourth quartile of data, ranging from 76-2,300 mt pollock/hour (2,300 mt would be from a very short haul that caught a lot of pollock).

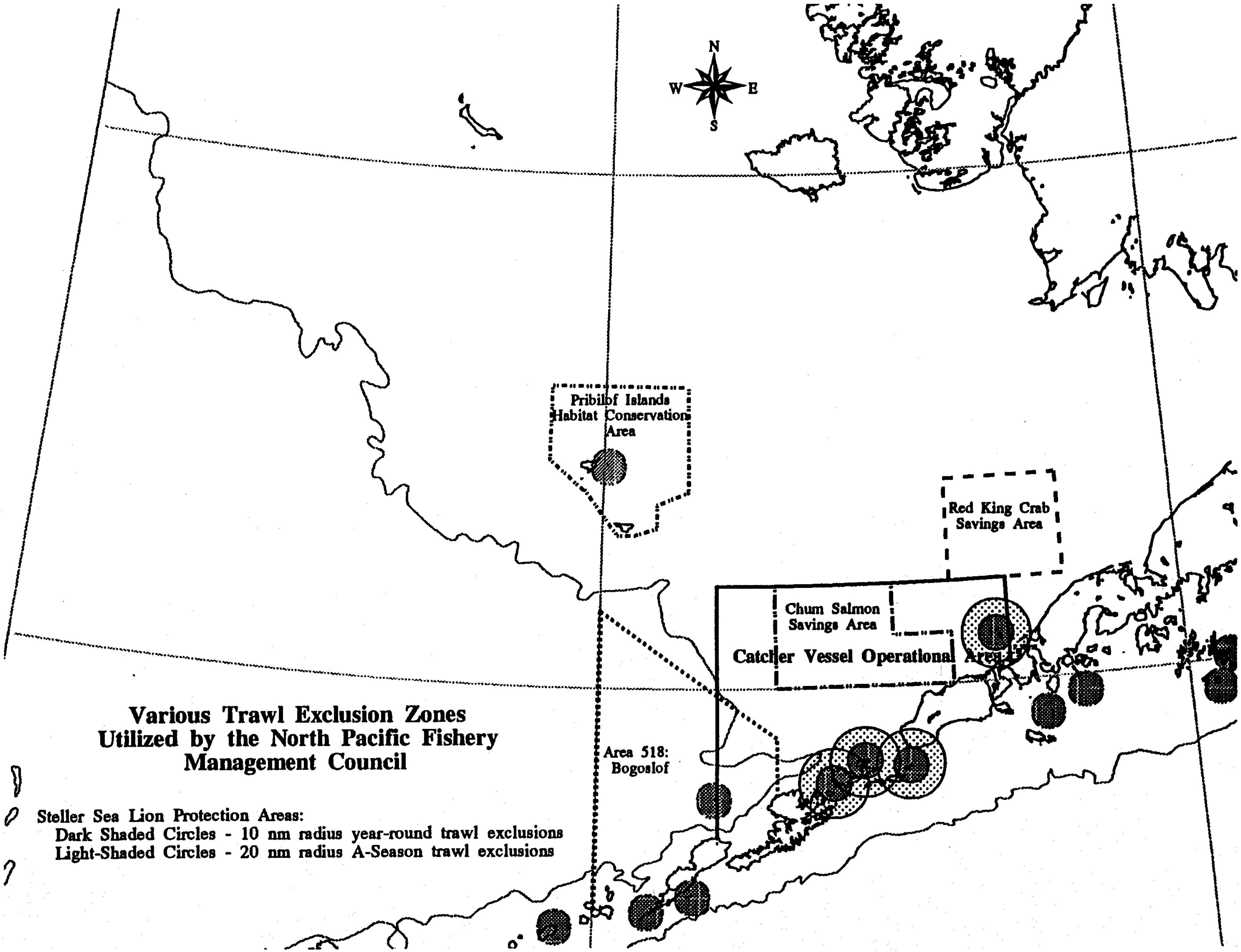
A-Season each year = January - April.

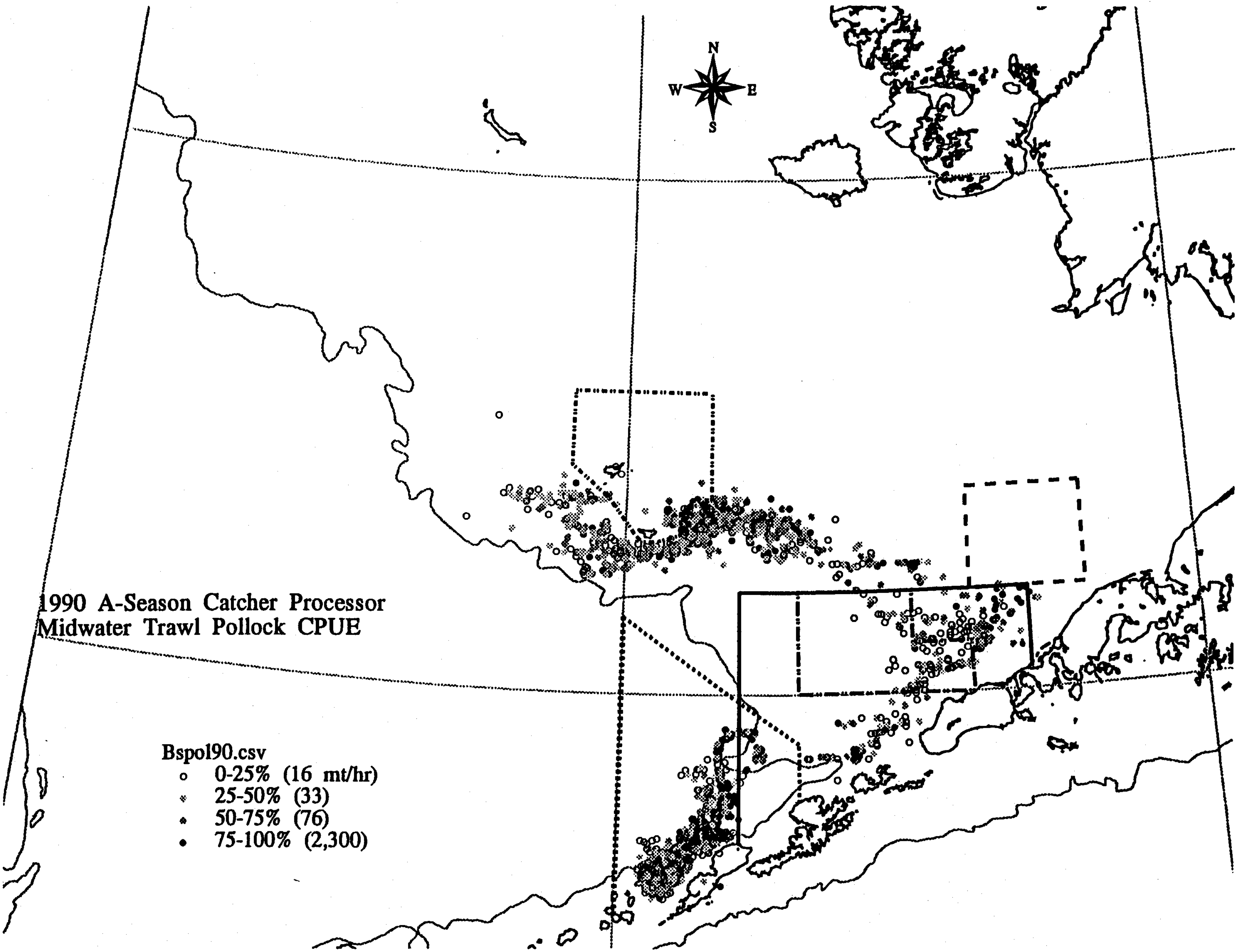
B-Seasons:

1990: June 1 - October 13;
1991: June 1 - September 4;
1992: June 1 - September 22 for onshore, June 1 - July 28 for offshore;
1993: August 15 - October 3 for onshore, August 15 - September 22 for offshore.

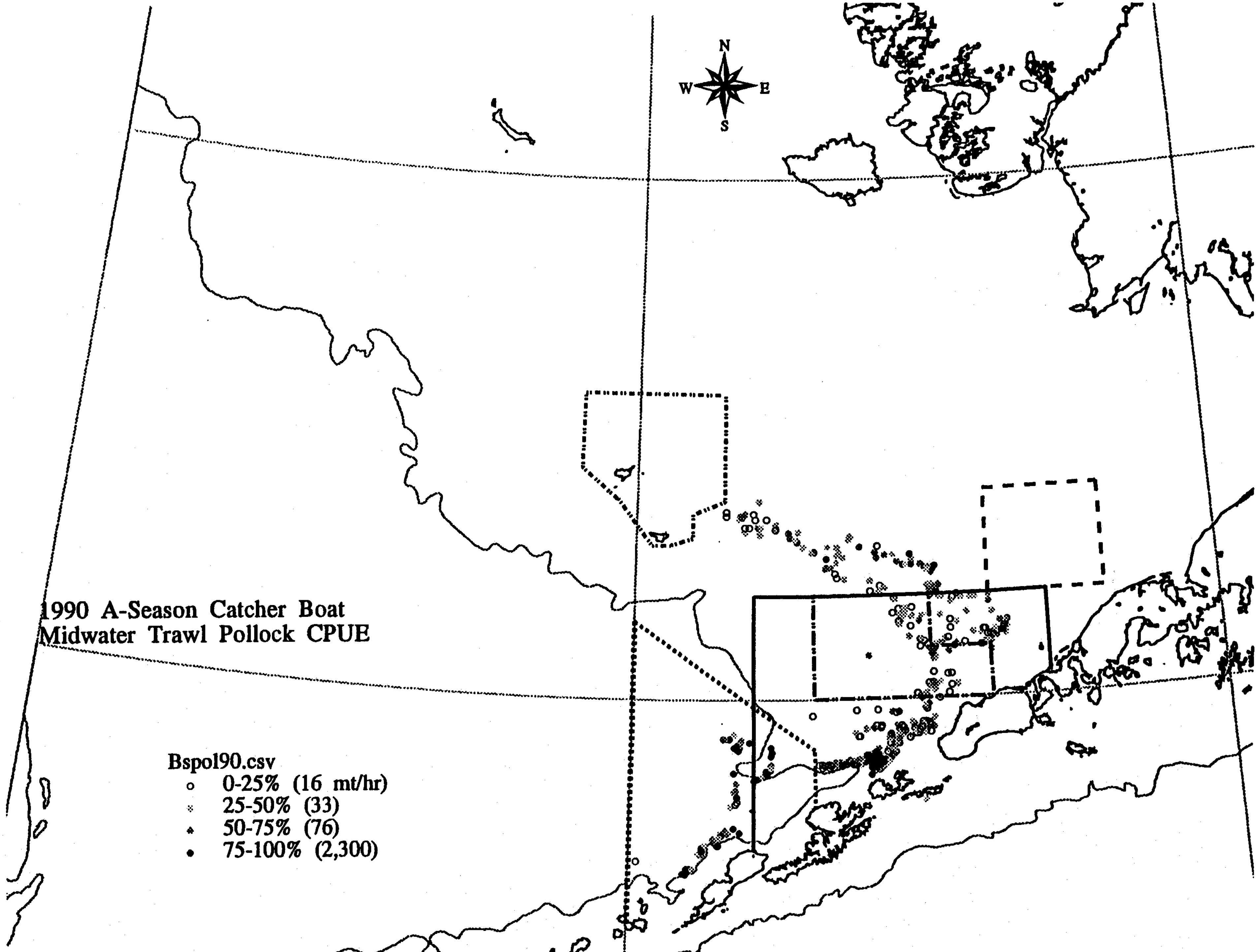
CDQ-Seasons:

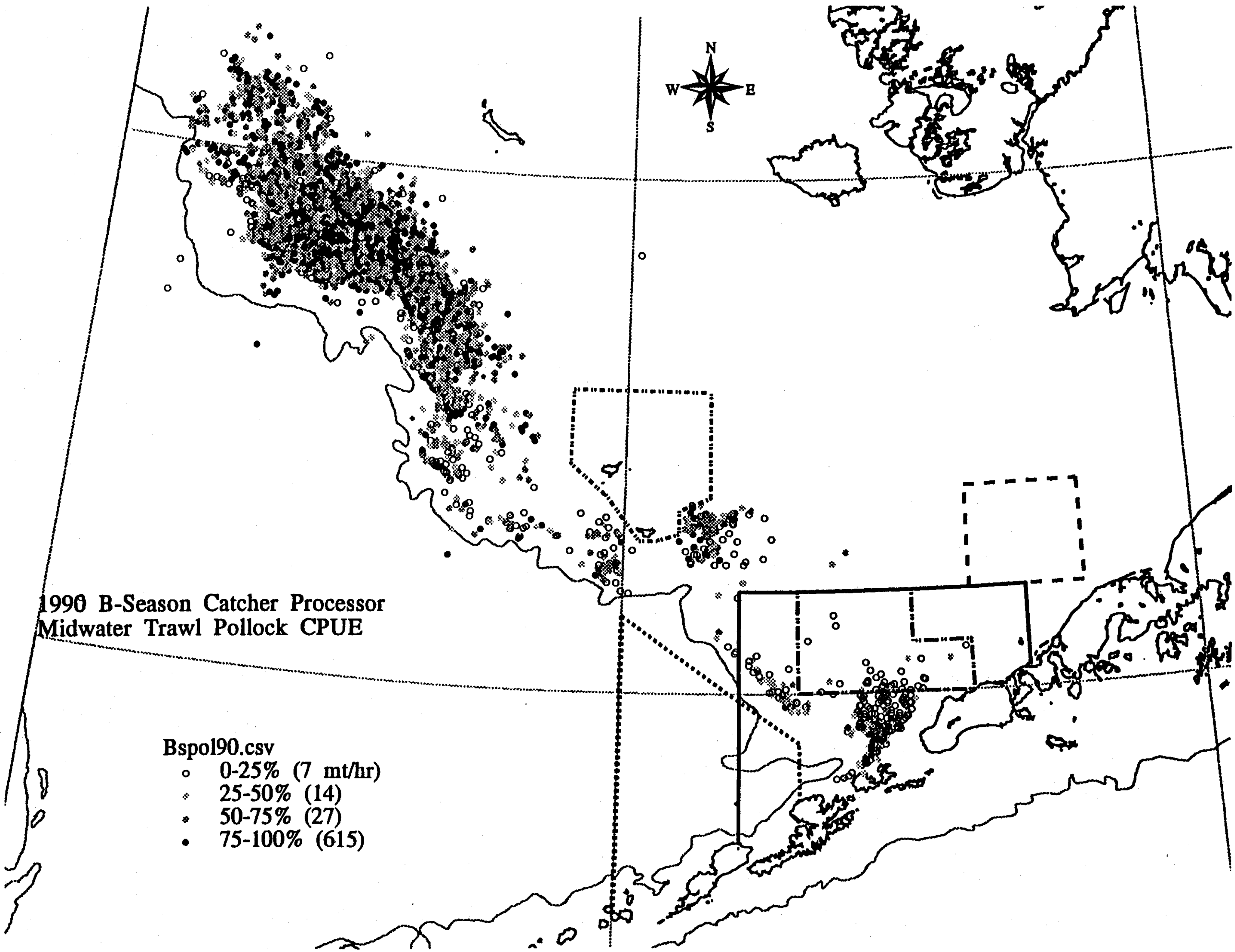
1992: December
1993: June 1 - August 14 and September 23 - December 31.

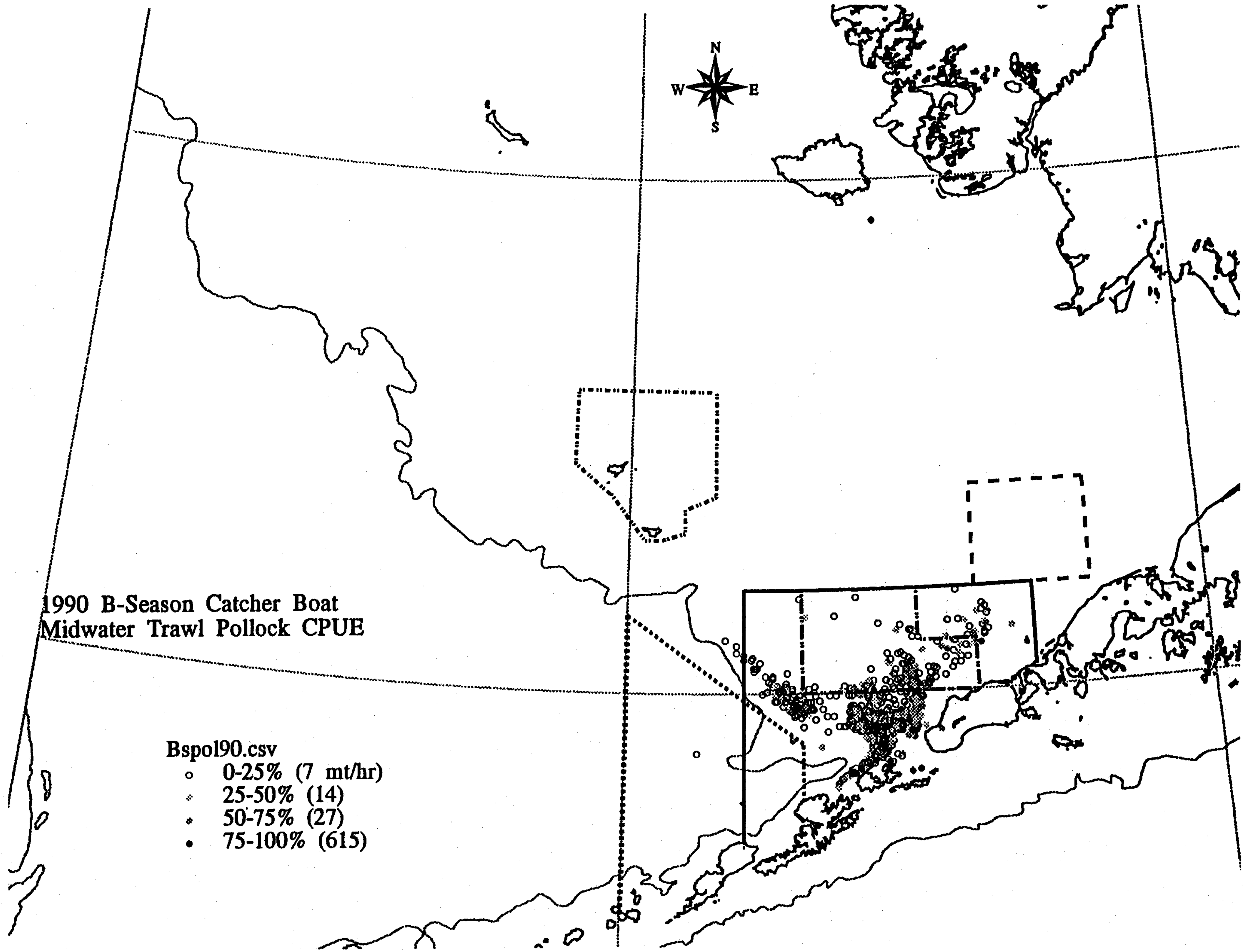

N
W
E
S
Pribilof Islands
Habitat Conservation
Area
Red King Crab
Savings Area
Chum Salmon
Savings Area
Catcher Vessel Operational Area
Area 518:
Bogoslof
Various Trawl Exclusion Zones
Utilized by the North Pacific Fishery
Management Council
Steller Sea Lion Protection Areas:
Dark Shaded Circles - 10 nm radius year-round trawl exclusions
Light-Shaded Circles - 20 nm radius A-Season trawl exclusions

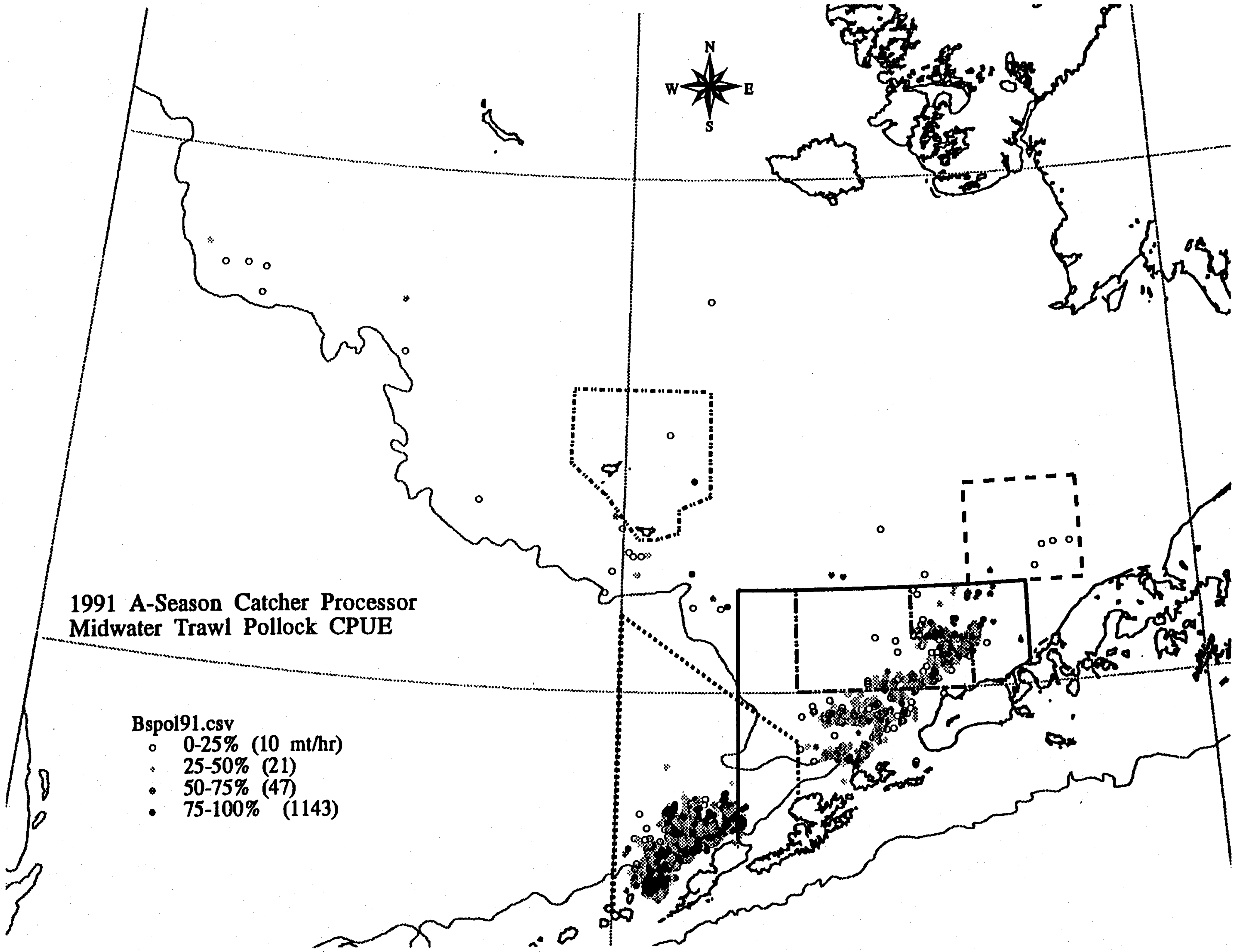


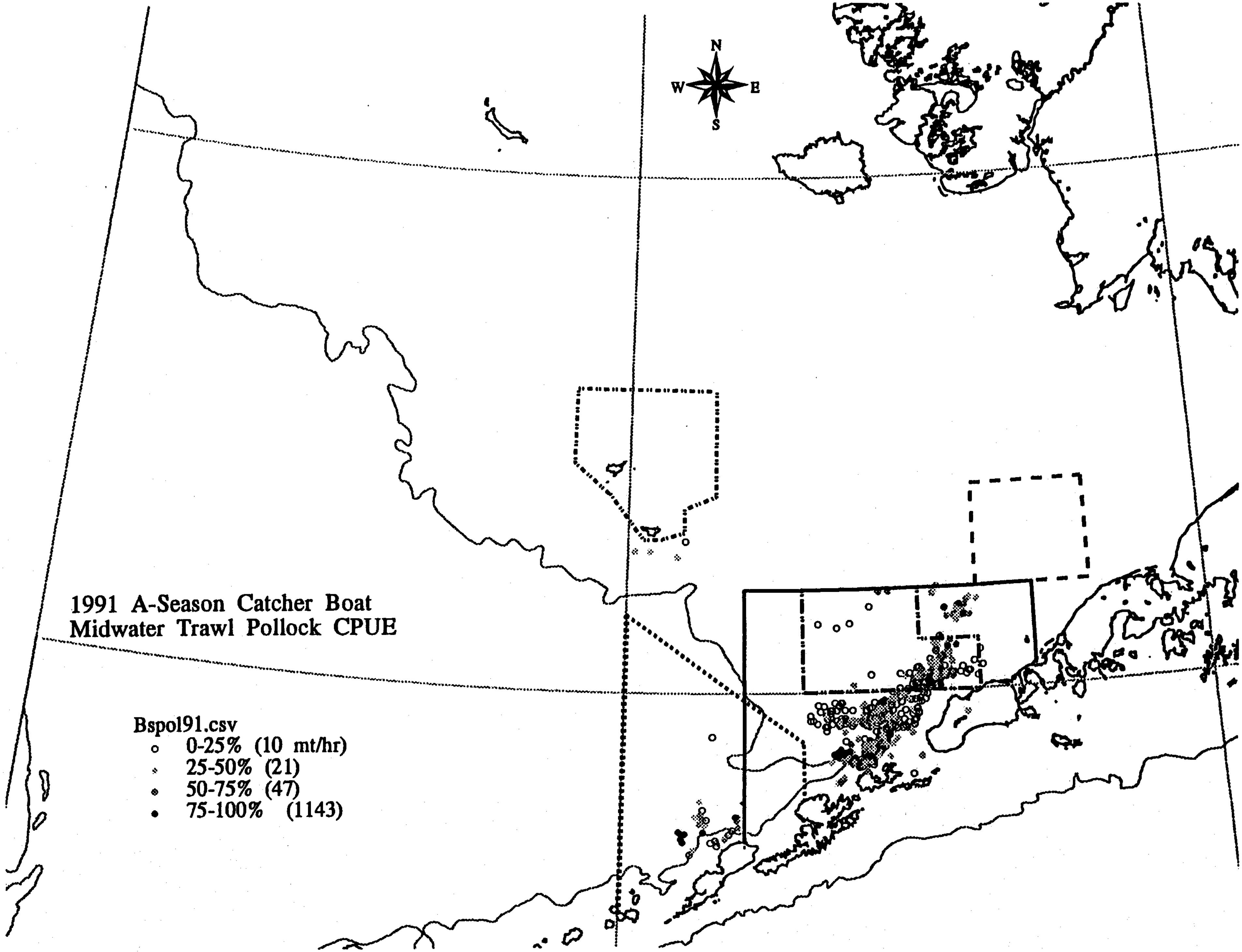
1990 A-Season Catcher Processor
Midwater Trawl Pollock CPUE
N
W
E
S
Bspol90.csv
0-25% (16 mt/hr)
25-50% (33)
50-75% (76)
75-100% (2,300)


N
W
E
S
1990 A-Season Catcher Boat
Midwater Trawl Pollock CPUE
Bspol90.csv
0-25% (16 mt/hr)
25-50% (33)
50-75% (76)
75-100% (2,300)

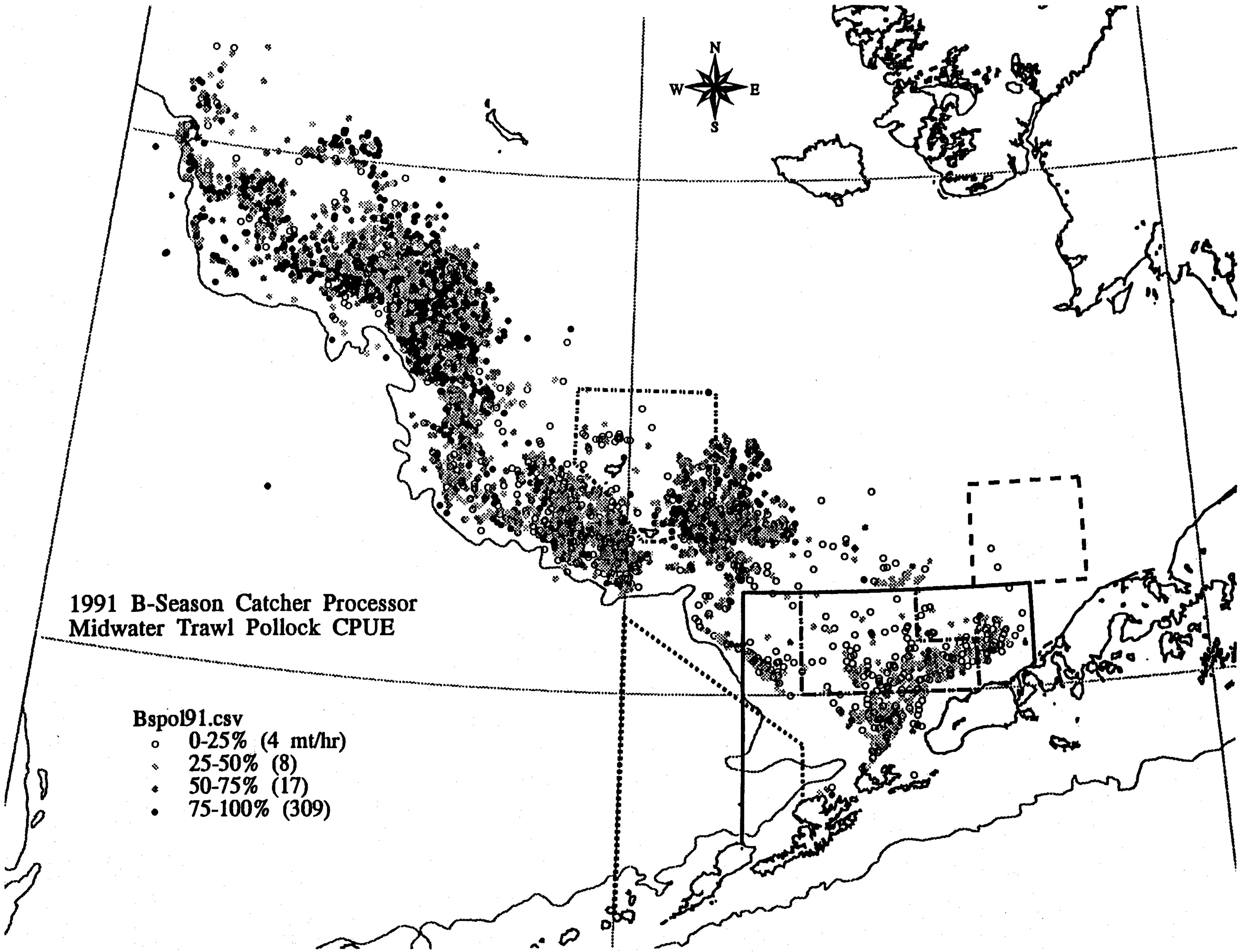

N
W
E
S
1990 B-Season Catcher Processor
Midwater Trawl Pollock CPUE
Bspol90.csv
0-25% (7 mt/hr)
25-50% (14)
50-75% (27)
75-100% (615)

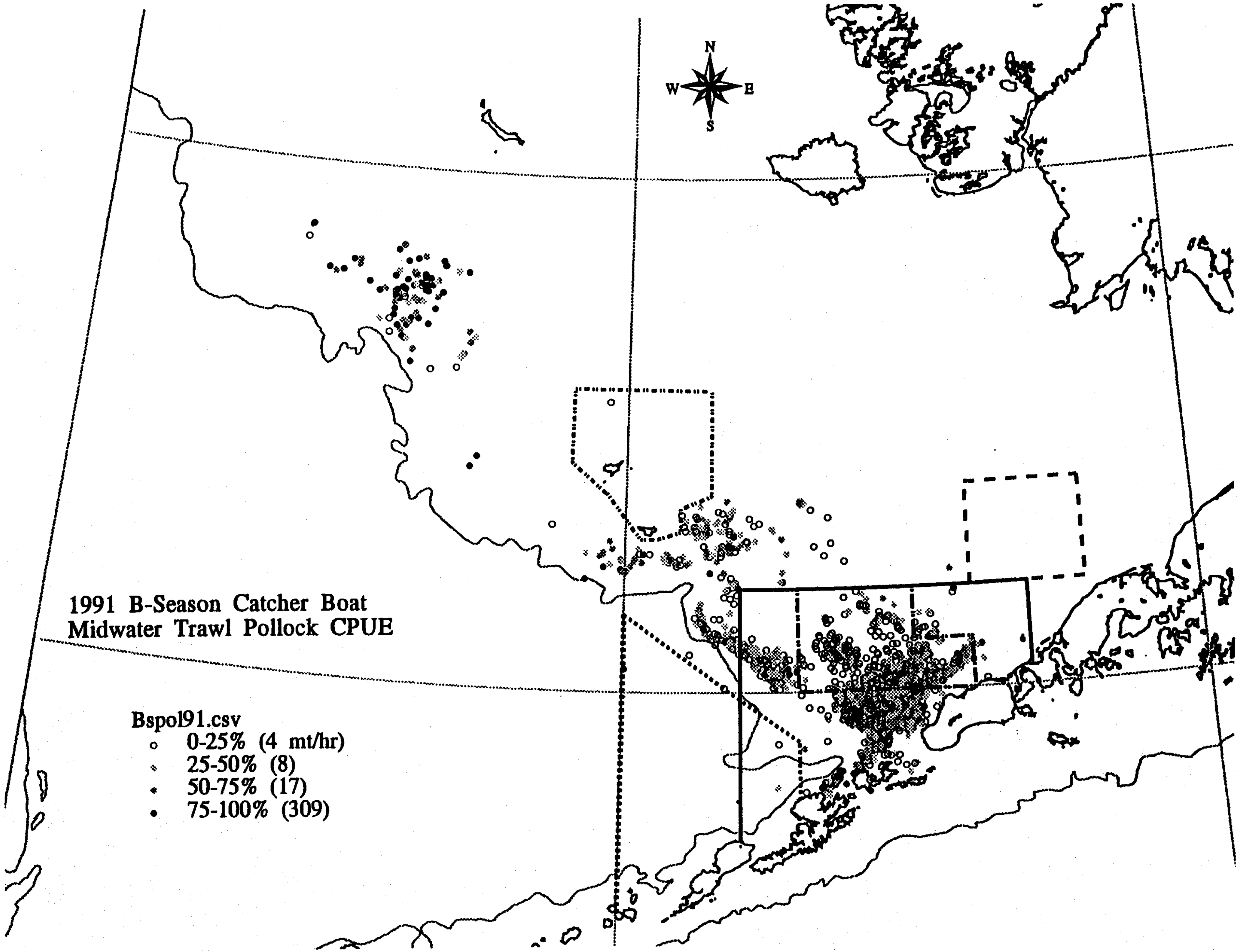

N
W
E
S
1990 B-Season Catcher Boat
Midwater Trawl Pollock CPUE
Bspol90.csv
0-25% (7 mt/hr)
25-50% (14)
50-75% (27)
75-100% (615)

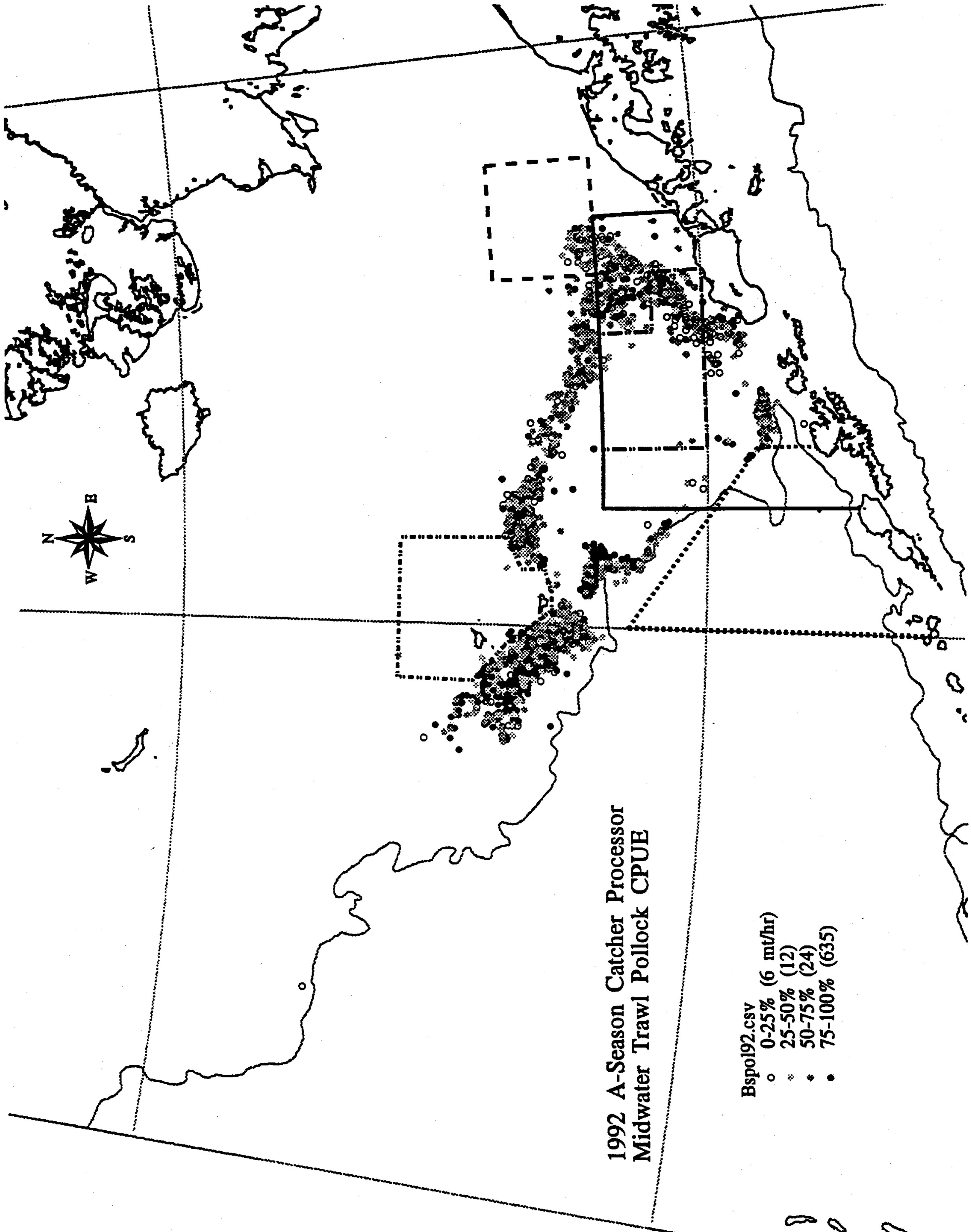

N
W
E
S
1991 A-Season Catcher Processor
Midwater Trawl Pollock CPUE
Bspol91.csv
0-25% (10 mt/hr)
25-50% (21)
50-75% (47)
75-100% (1143)

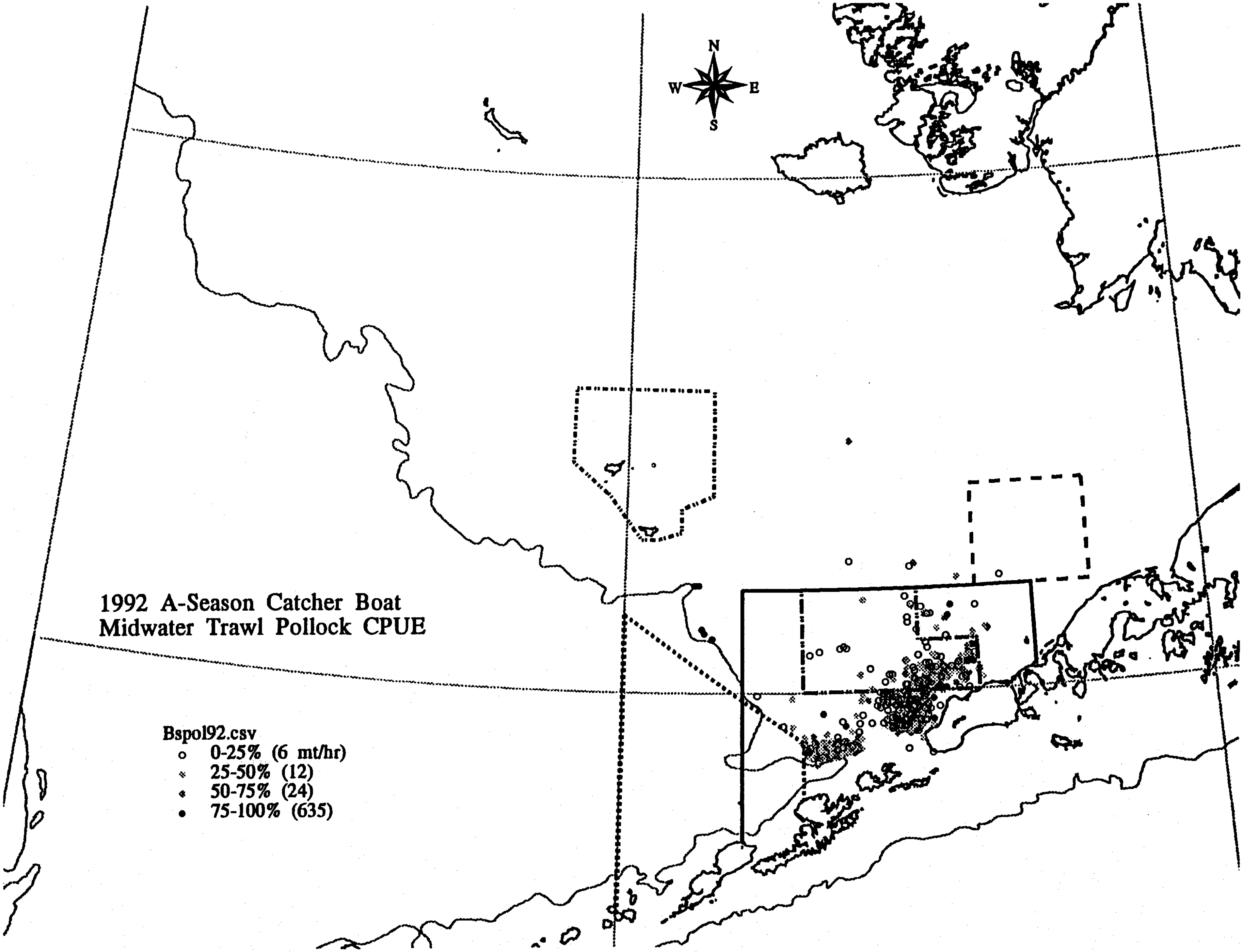

N
W
E
S
1991 A-Season Catcher Boat
Midwater Trawl Pollock CPUE
Bspol91.csv
0-25% (10 mt/hr)
25-50% (21)
50-75% (47)
75-100% (1143)

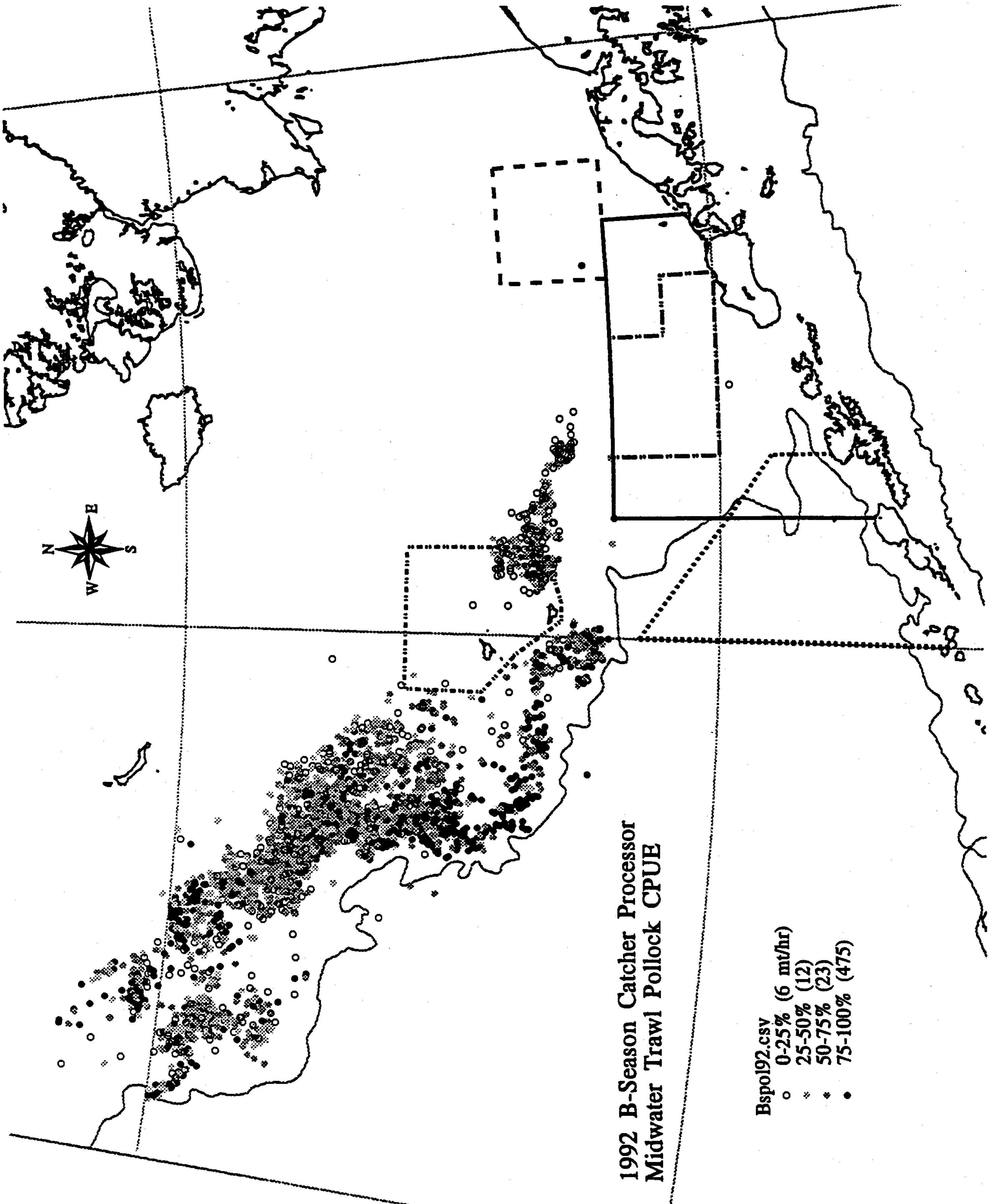
1991 B-Season Catcher Processor
Midwater Trawl Pollock CPUE

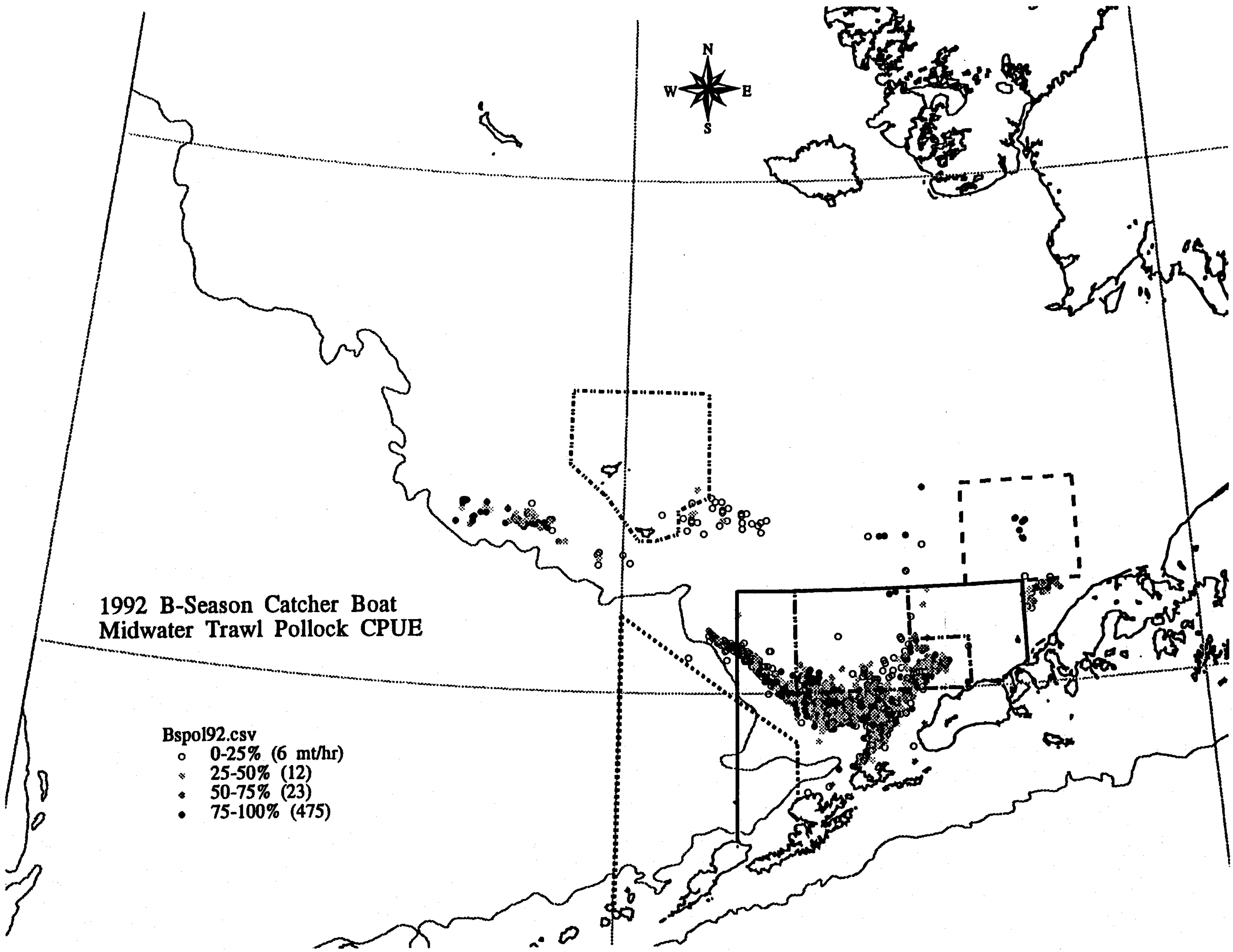


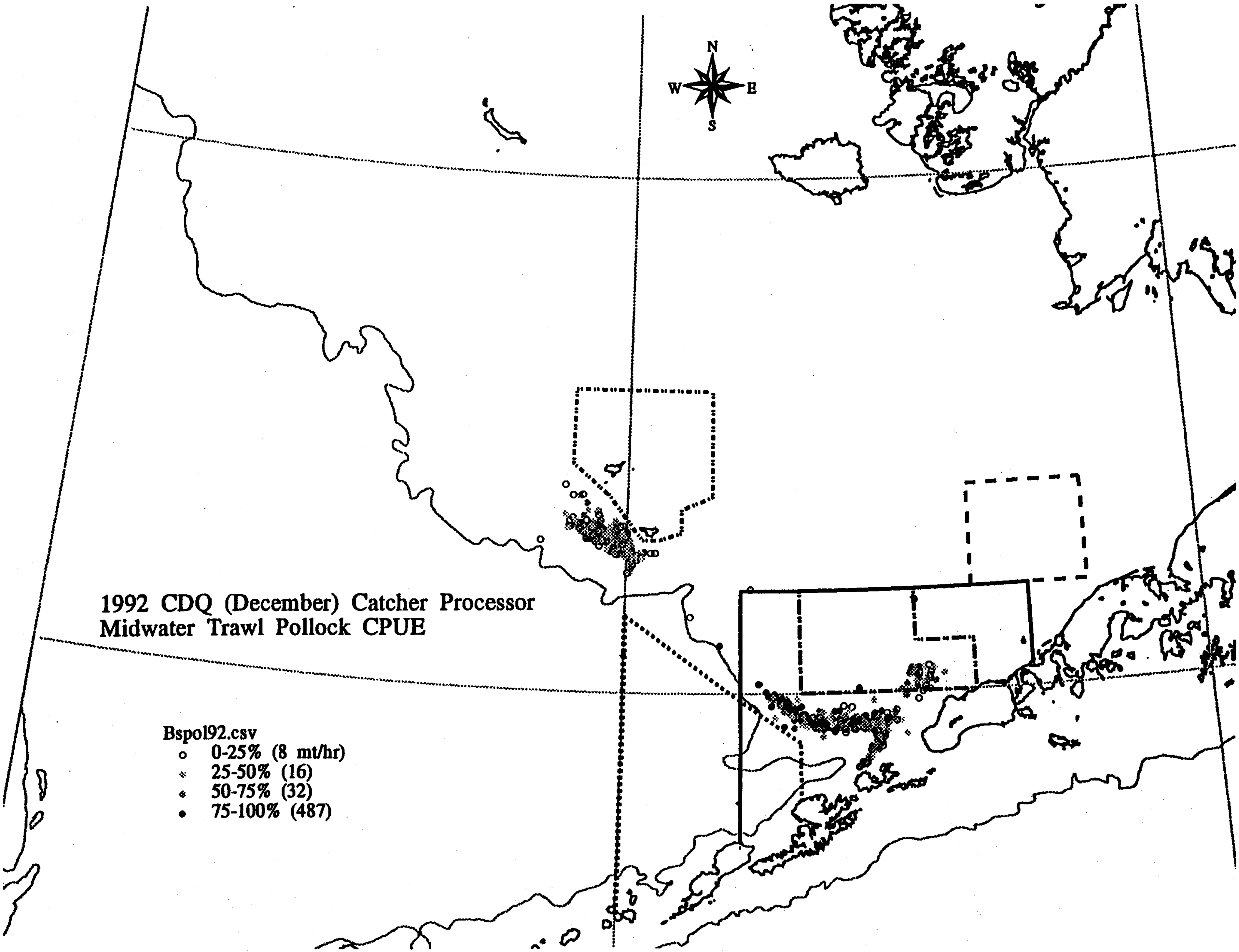

N
W
E
S
1991 B-Season Catcher Boat
Midwater Trawl Pollock CPUE
Bspol91.csv
0-25% (4 mt/hr)
25-50% (8)
50-75% (17)
75-100% (309)

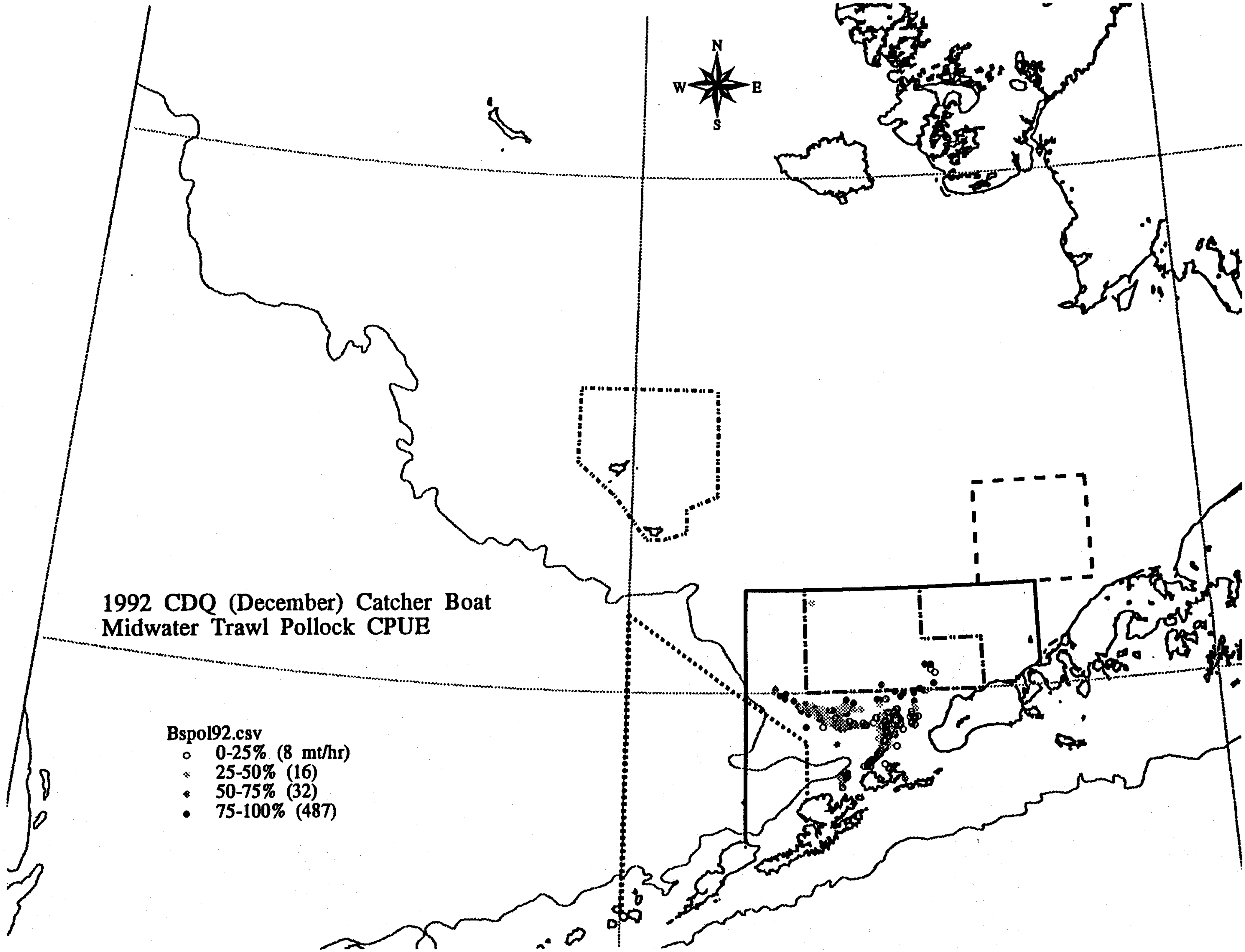

1992 A-Season Catcher Processor
Midwater Trawl Pollock CPUE
Bspol92.csv
0-25% (6 mt/hr)
25-50% (12)
50-75% (24)
75-100% (635)
N
E
S
W

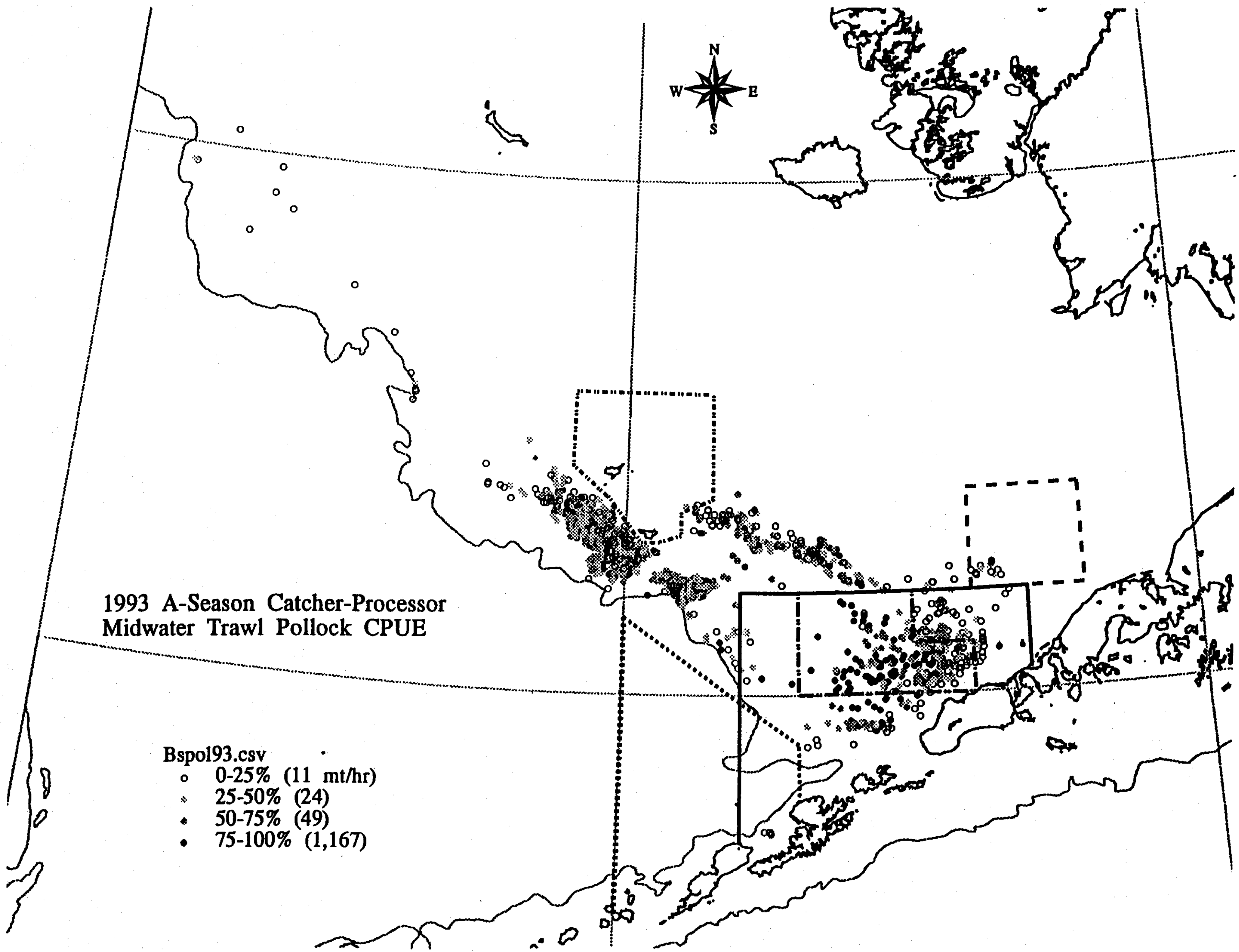

N
W
E
S
1992 A-Season Catcher Boat
Midwater Trawl Pollock CPUE
Bspol92.csv
0-25% (6 mt/hr)
25-50% (12)
50-75% (24)
75-100% (635)

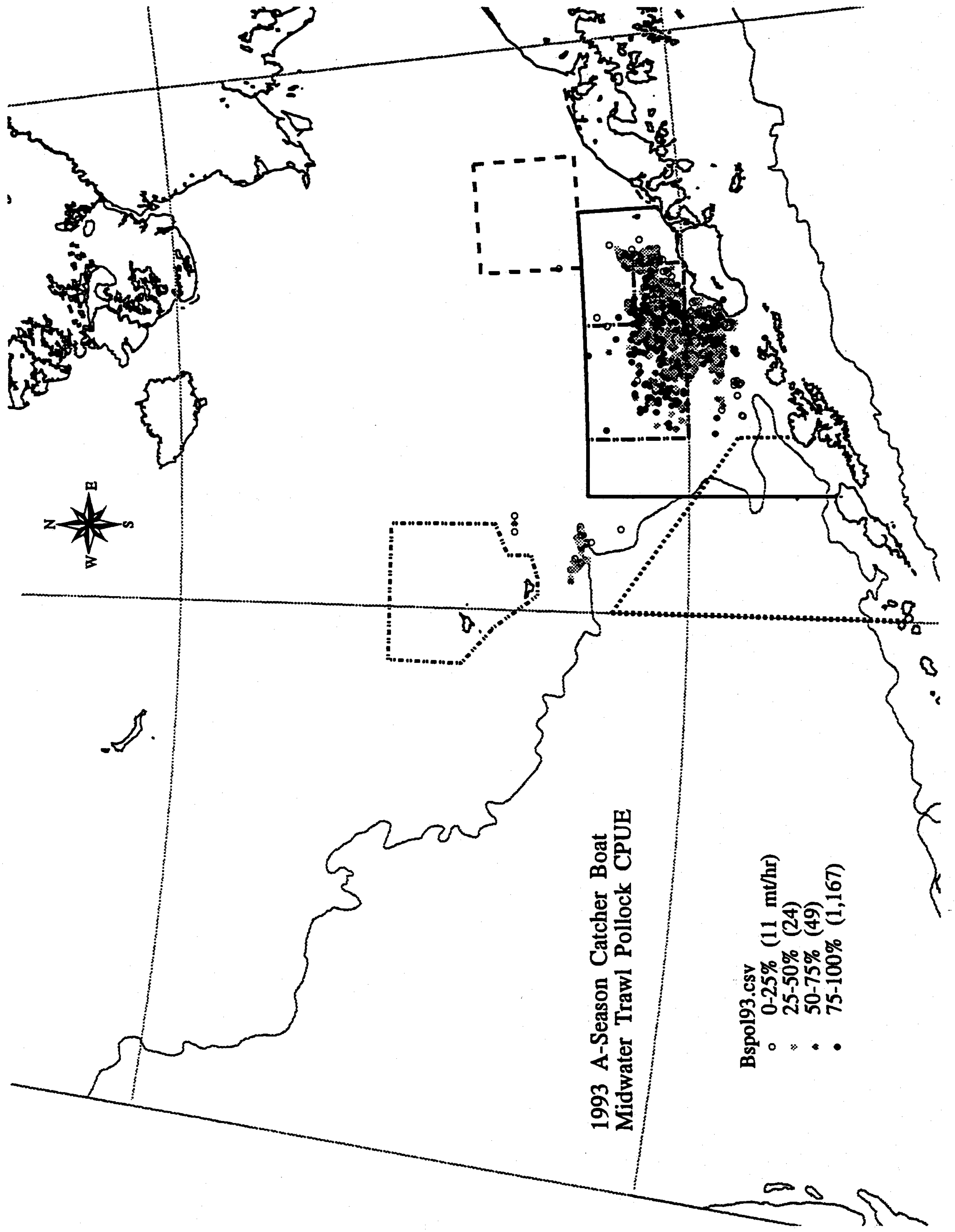

1992 B-Season Catcher Processor
Midwater Trawl Pollock CPUE
Bspol92.csv
0-25% (6 mt/hr)
25-50% (12)
50-75% (23)
75-100% (475)
N
E
S
W

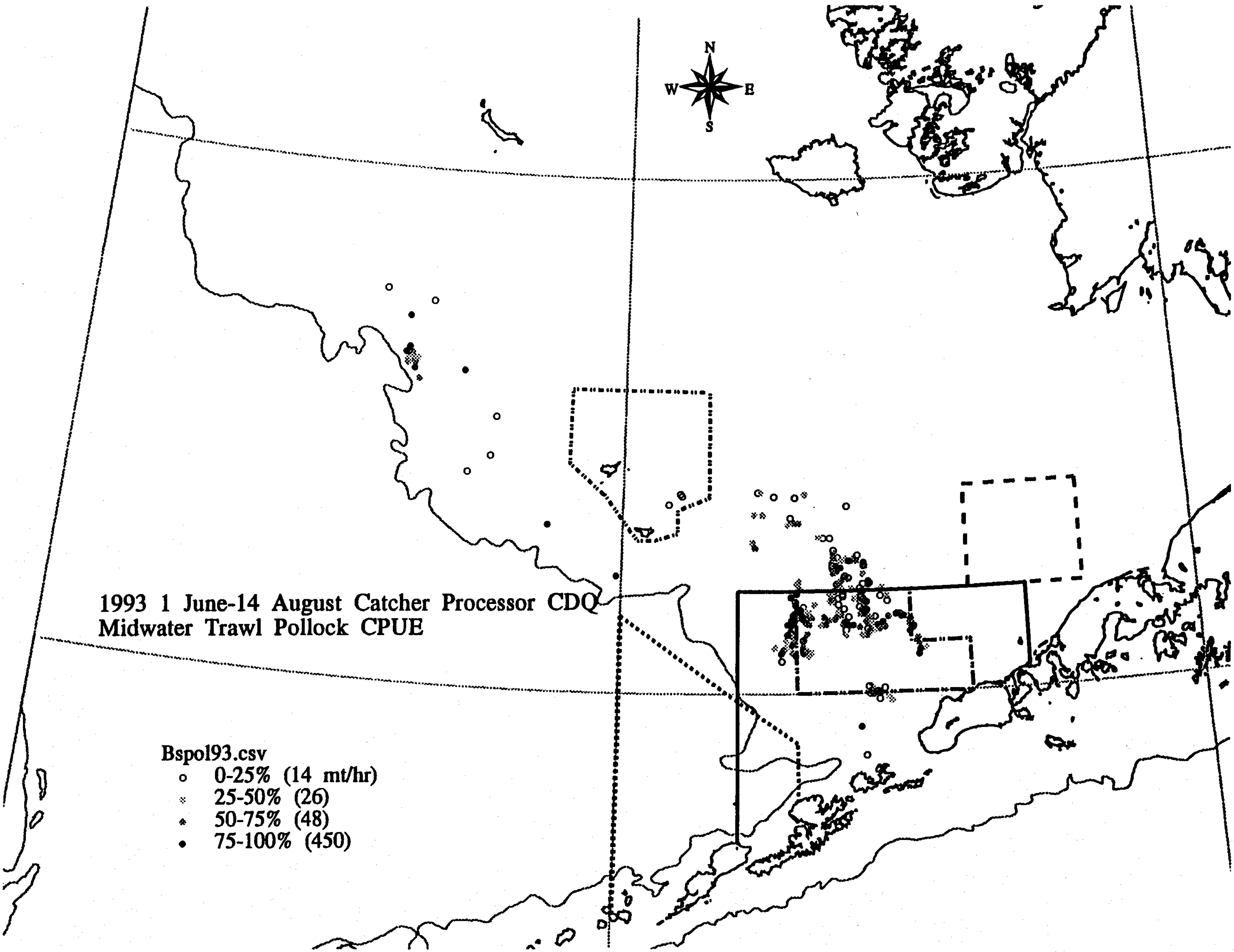

N
W
E
S
1992 B-Season Catcher Boat
Midwater Trawl Pollock CPUE
Bspol92.csv
0-25% (6 mt/hr)
25-50% (12)
50-75% (23)
75-100% (475)


1992 CDQ (December) Catcher Processor
Midwater Trawl Pollock CPUE
N
W
E
S
Bspol92.csv
0-25% (8 mt/hr)
25-50% (16)
50-75% (32)
75-100% (487)

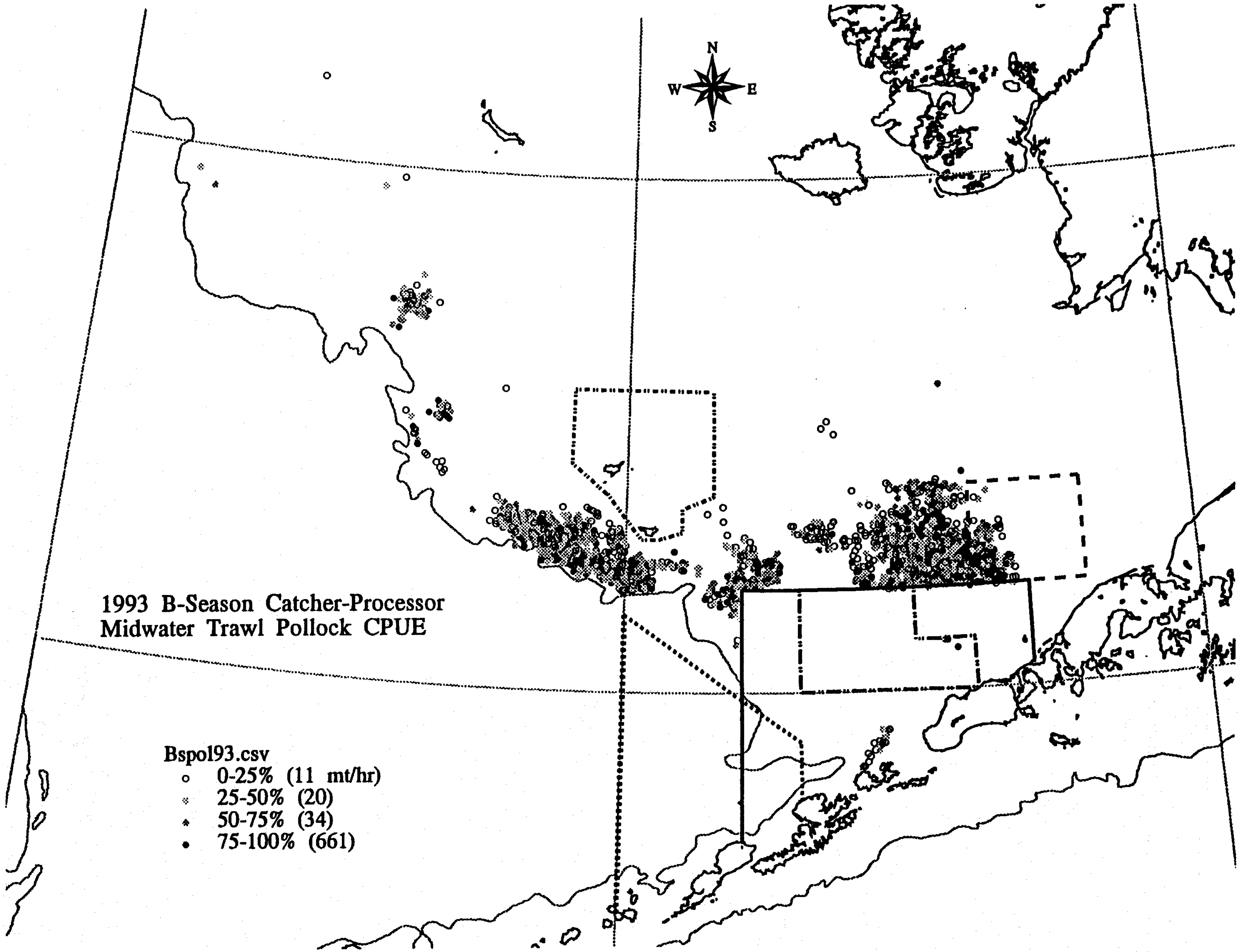

N
W
E
S
1992 CDQ (December) Catcher Boat
Midwater Trawl Pollock CPUE
Bspol92.csv
0-25% (8 mt/hr)
25-50% (16)
50-75% (32)
75-100% (487)

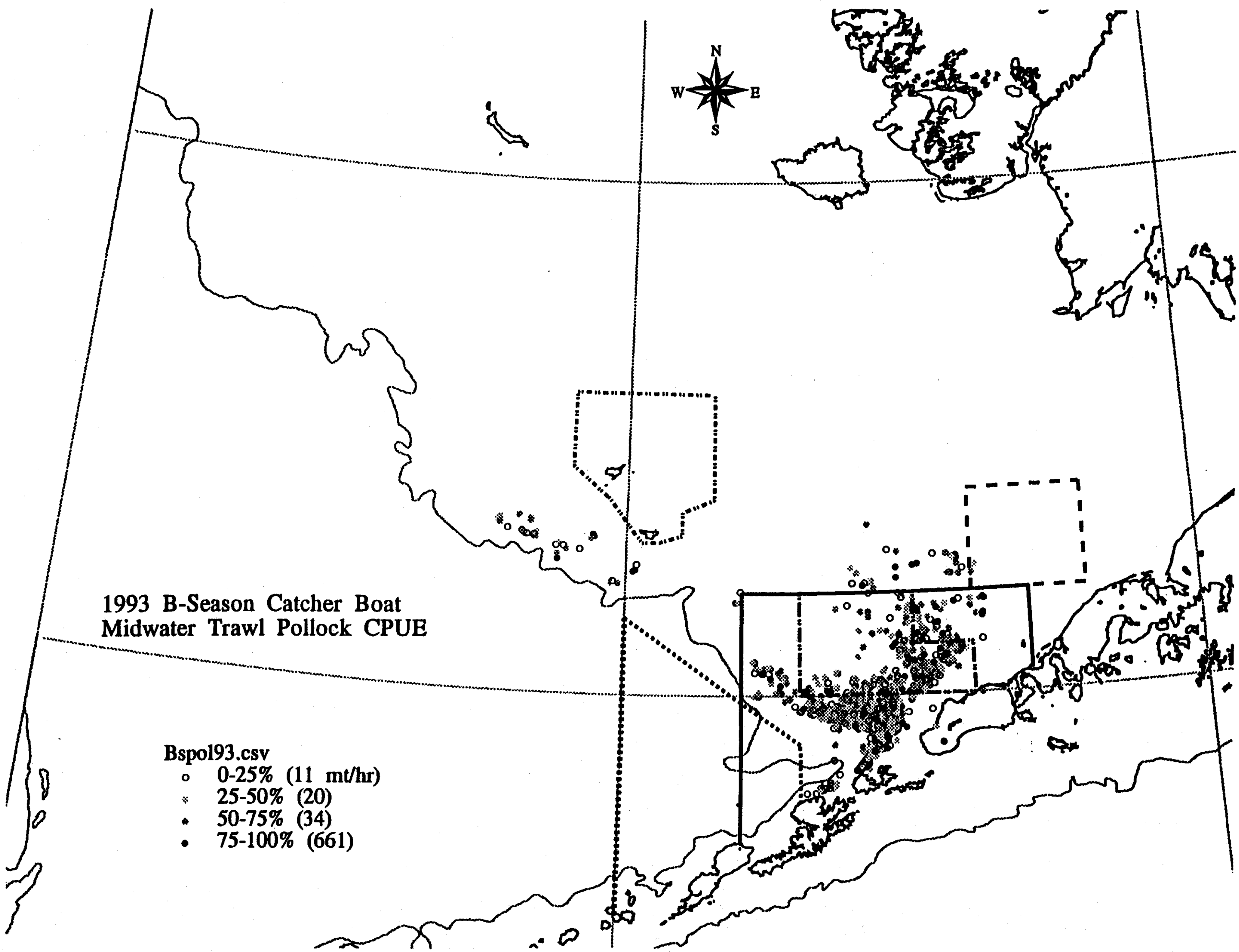

N
W
E
S
1993 A-Season Catcher-Processor
Midwater Trawl Pollock CPUE
Bspol93.csv
0-25% (11 mt/hr)
25-50% (24)
50-75% (49)
75-100% (1,167)


1993 A-Season Catcher Boat
Midwater Trawl Pollock CPUE
Bspol93.csv
0-25% (11 mt/hr)
25-50% (24)
50-75% (49)
75-100% (1,167)
N
E
S
W



1993 1 June-14 August Catcher Processor CDQ
Midwater Trawl Pollock CPUE
N
W
E
S
Bspol93.csv
0-25% (14 mt/hr)
25-50% (26)
50-75% (48)
75-100% (450)


N
W
E
S
1993 B-Season Catcher-Processor
Midwater Trawl Pollock CPUE
Bspol93.csv
0-25% (11 mt/hr)
25-50% (20)
50-75% (34)
75-100% (661)


N
W
E
S
1993 B-Season Catcher Boat
Midwater Trawl Pollock CPUE
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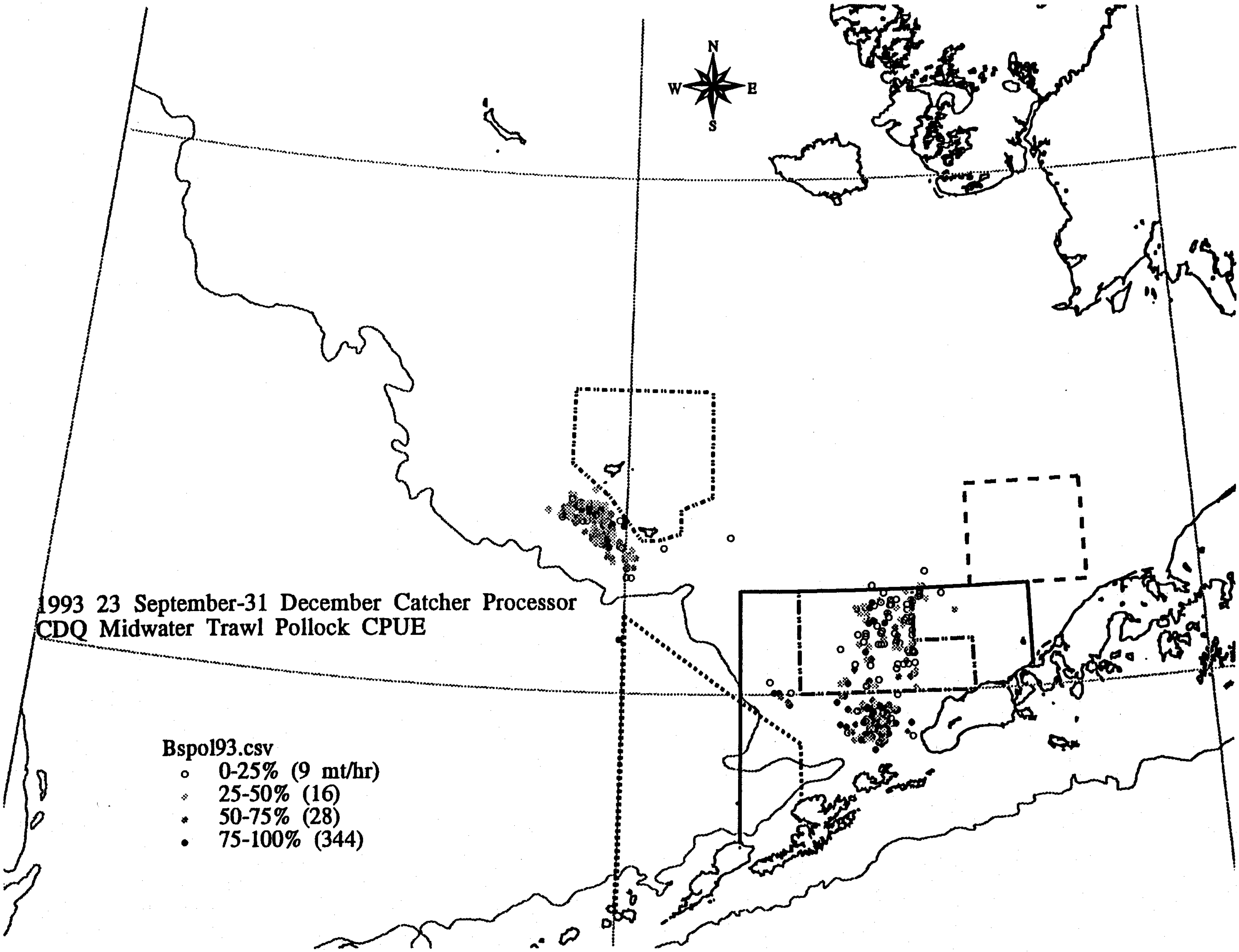
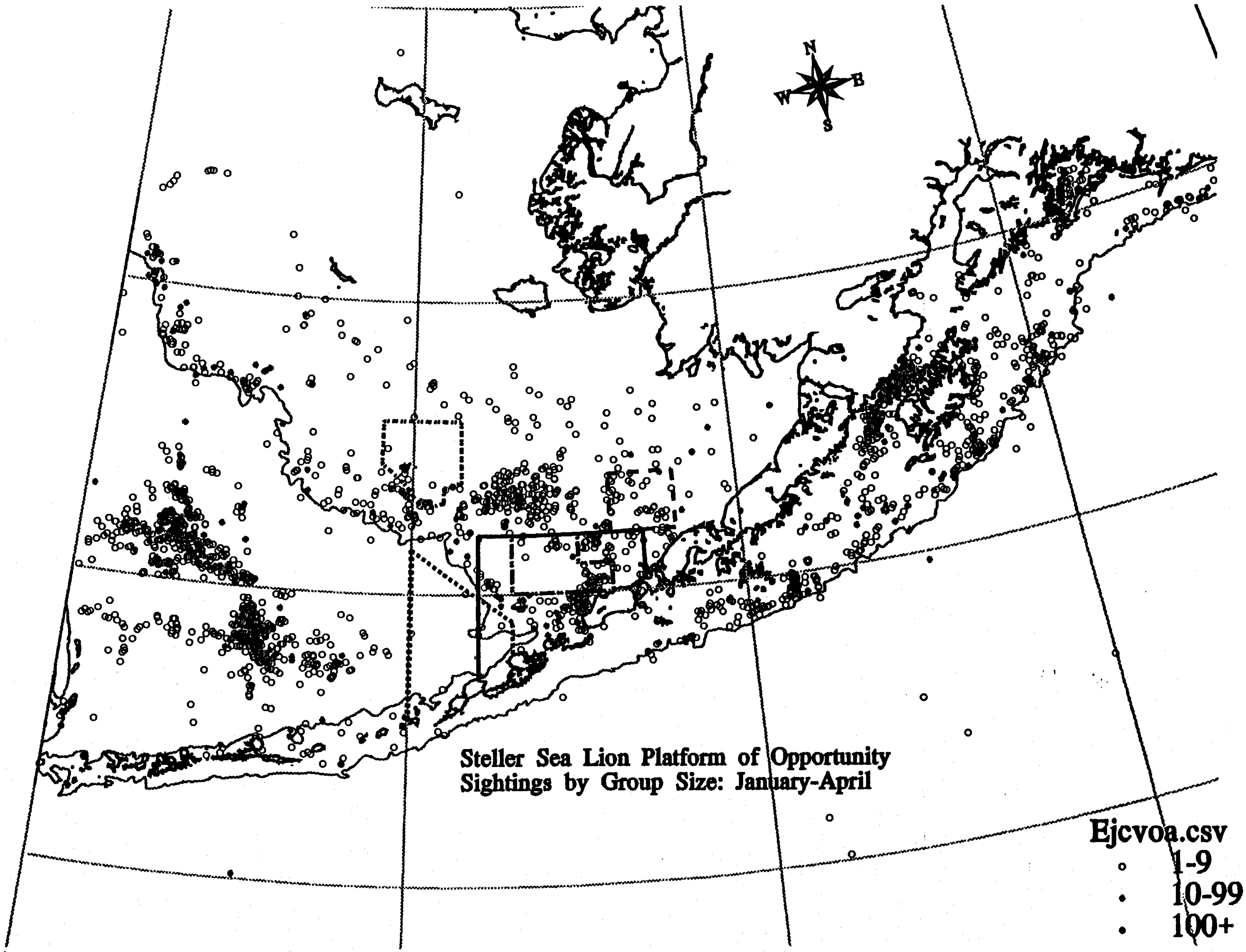
25-50% (20)
50-75% (34)
75-100% (661)


N
W
E
S
1993 23 September-31 December Catcher Processor
CDQ Midwater Trawl Pollock CPUE
Bspol93.csv
0-25% (9 mt/hr)
25-50% (16)
50-75% (28)
75-100% (344)

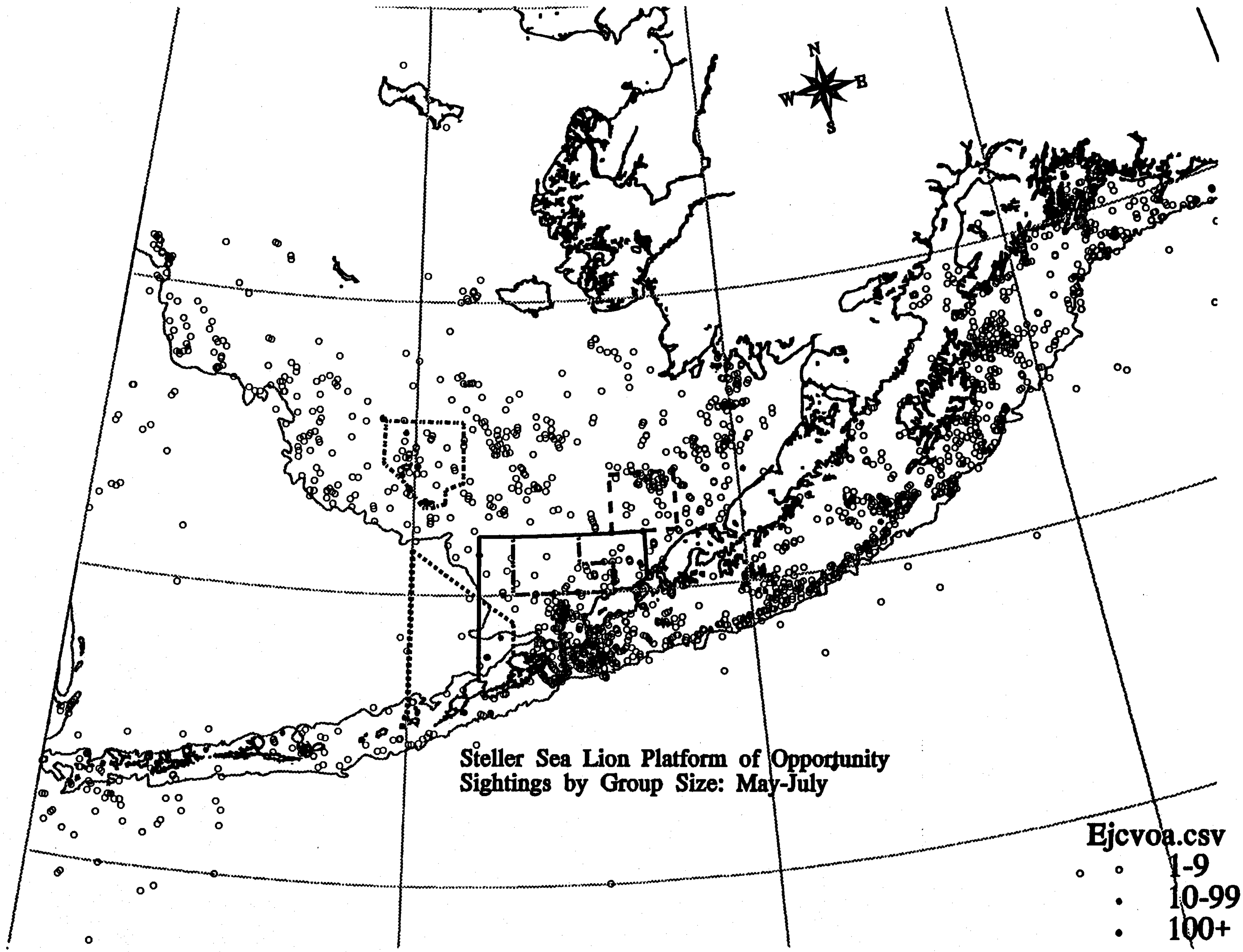
Appendix II

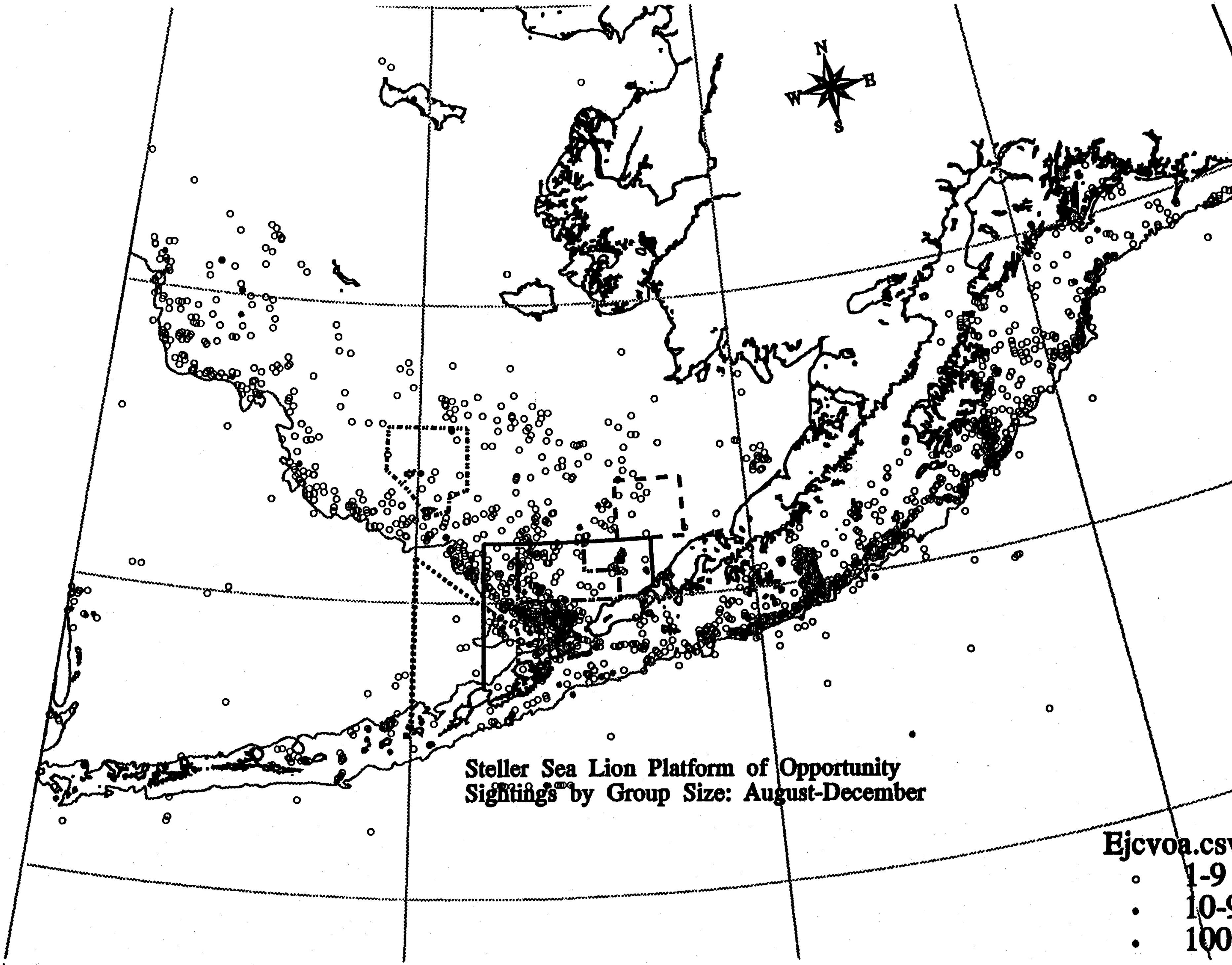
Platform of opportunity sightings of Steller sea lions, harbor seals, northern fur seals, killer whales, and gray whales, by season (January-April, May-July, and August-December.

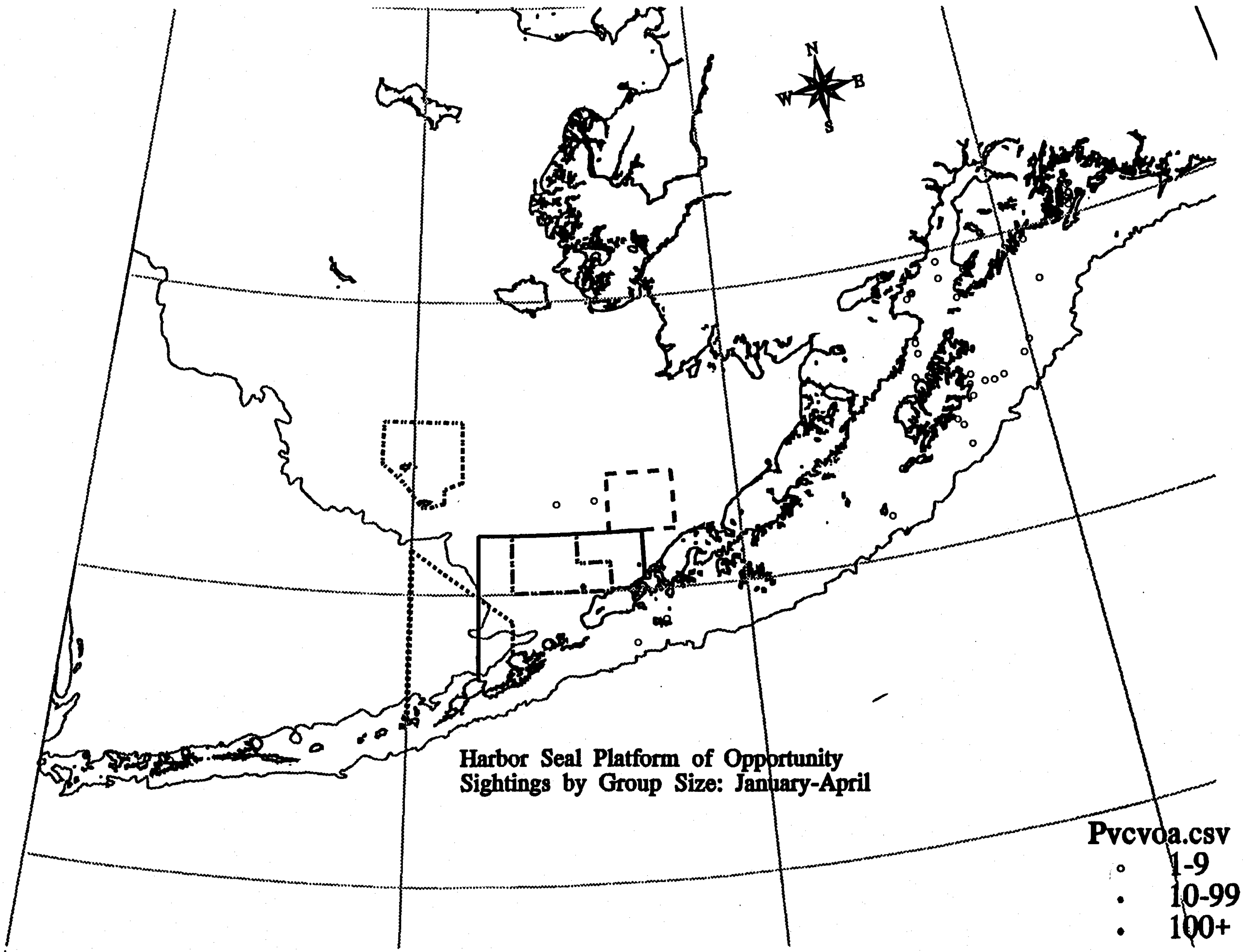
Data are from the late 1950s through 1991. Sighting locations are scaled by group size (open circles = 1-9 animals; gray circles = 10-99 animals; dark circles = 100+ animals in group). Trawl exclusion zones described in Appendix 1 are shown.

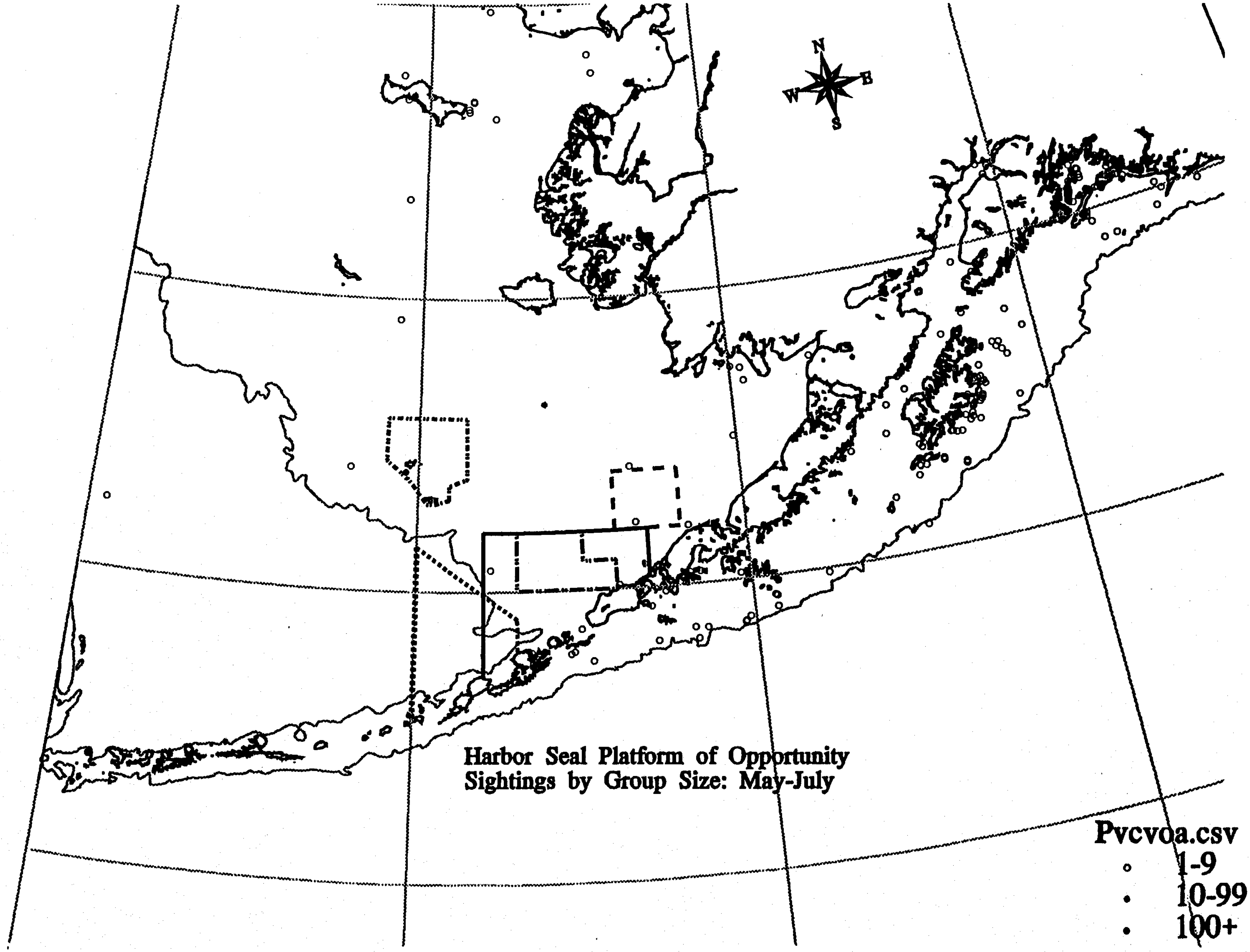


Steller Sea Lion Platform of Opportunity
Sightings by Group Size: January-April

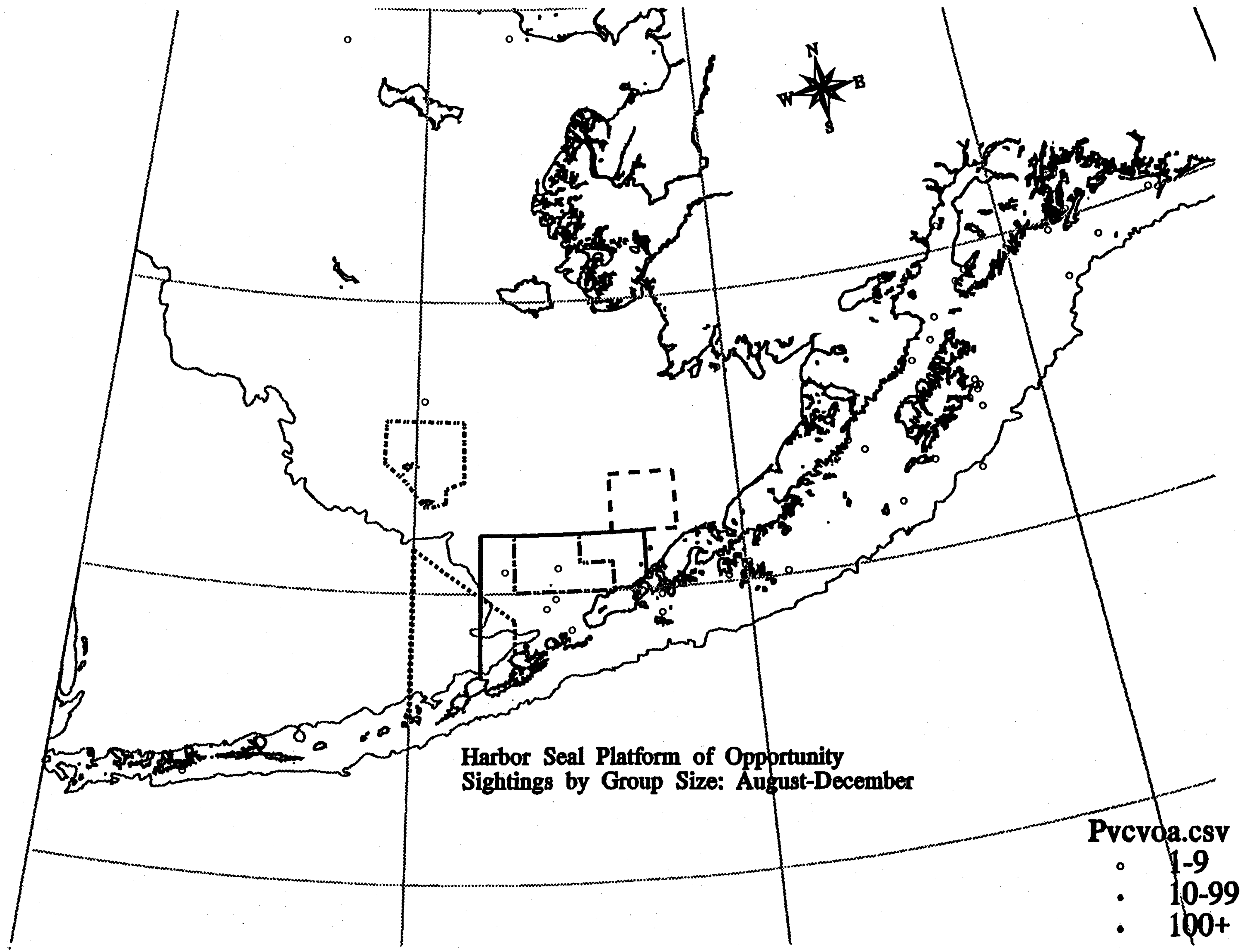

N
E
S
W
Steller Sea Lion Platform of Opportunity
Sightings by Group Size: May-July
Ejcvoa.csv
1-9
10-99
100+
P

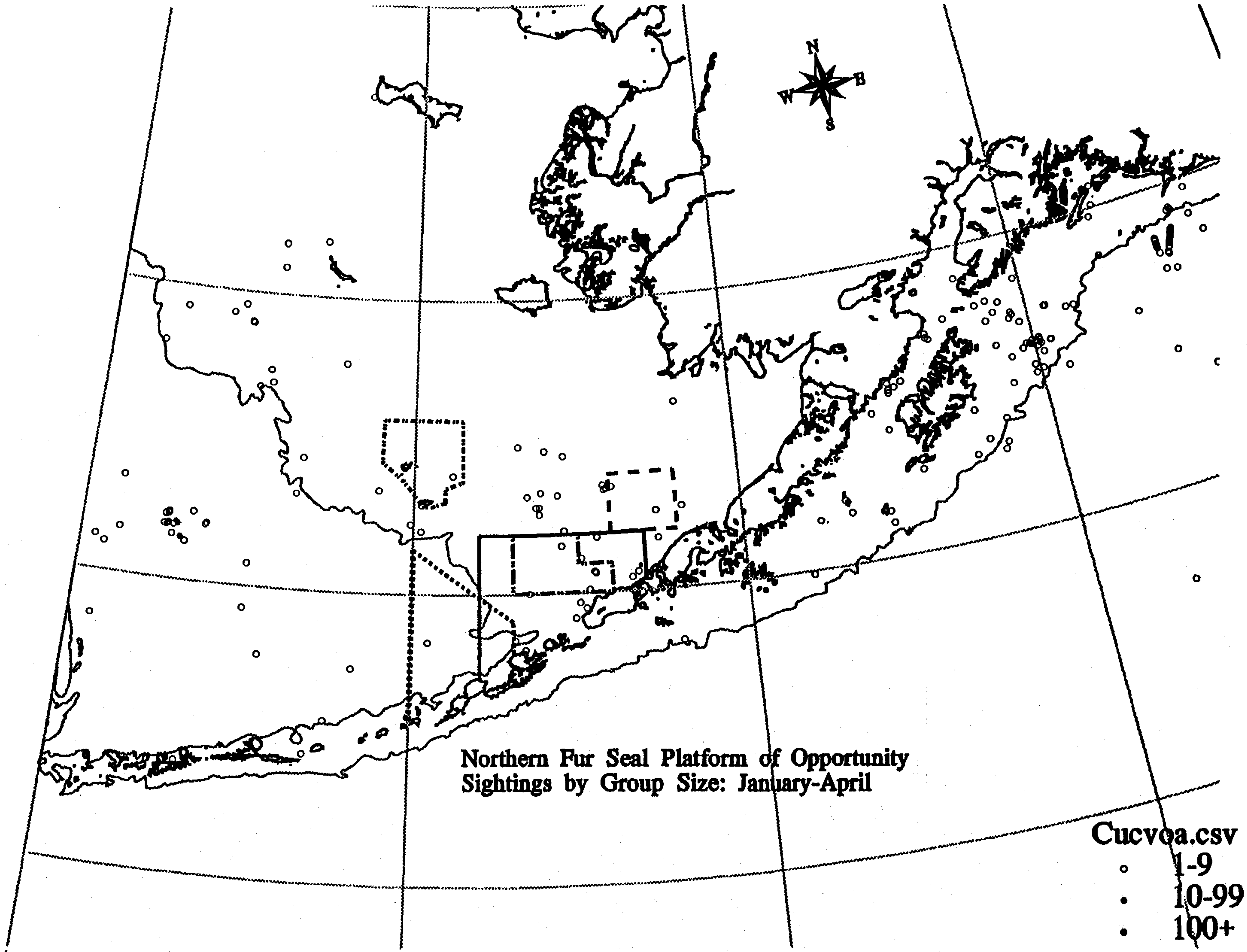

N
W
E
S
Steller Sea Lion Platform of Opportunity
Sightings by Group Size: August-December
Ejcvoa.csv
1-9
10-99
100+

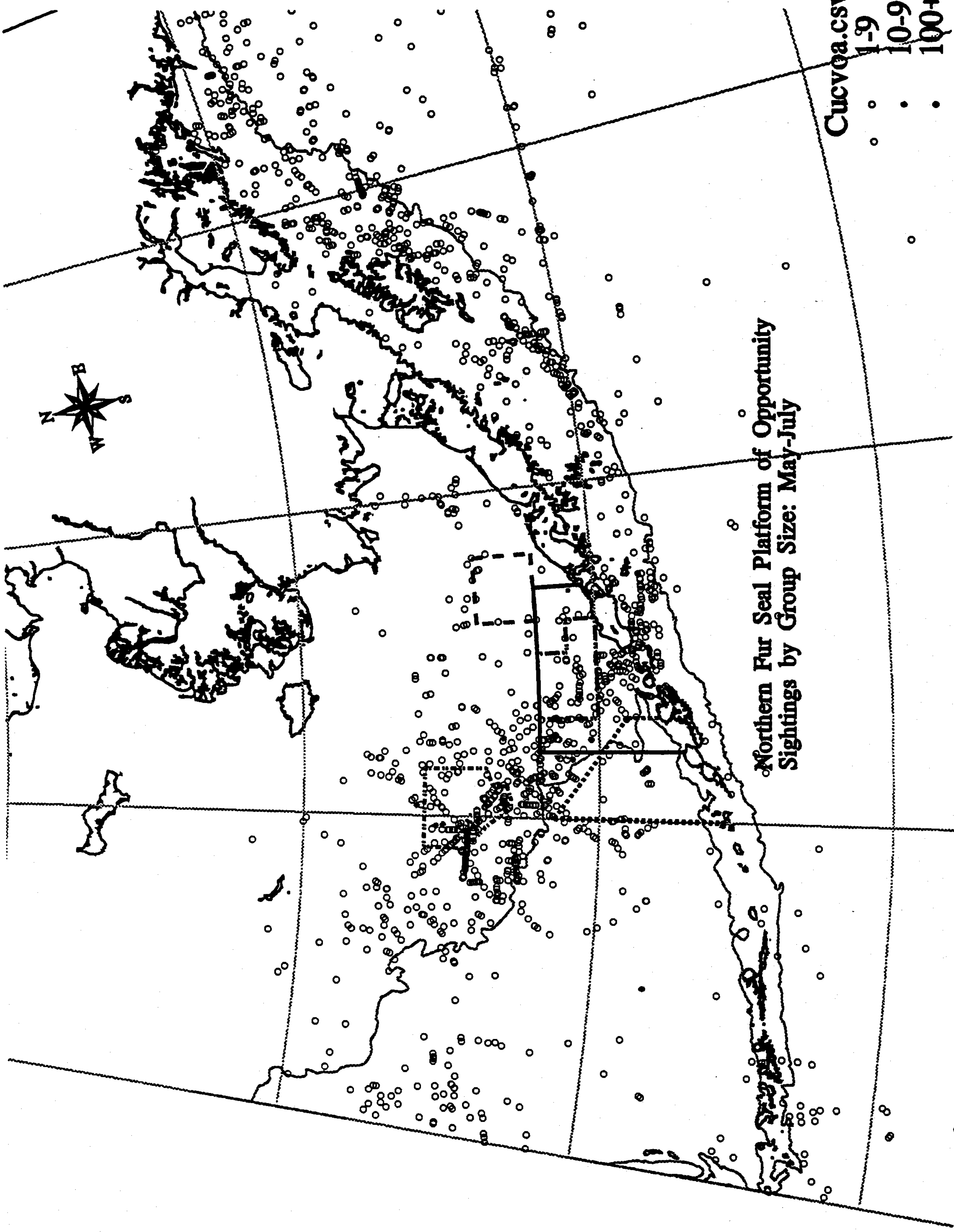

N
E
S
W
Harbor Seal Platform of Opportunity
Sightings by Group Size: January-April
Pvcvoa.csv
1-9
10-99
100+



Harbor Seal Platform of Opportunity
Sightings by Group Size: May-July


N
E
S
W
Harbor Seal Platform of Opportunity
Sightings by Group Size: August-December
Pvcvoa.csv
1-9
10-99
100+


N
W
E
S
Northern Fur Seal Platform of Opportunity
Sightings by Group Size: January-April
Cucvoa.csv
1-9
10-99
100+



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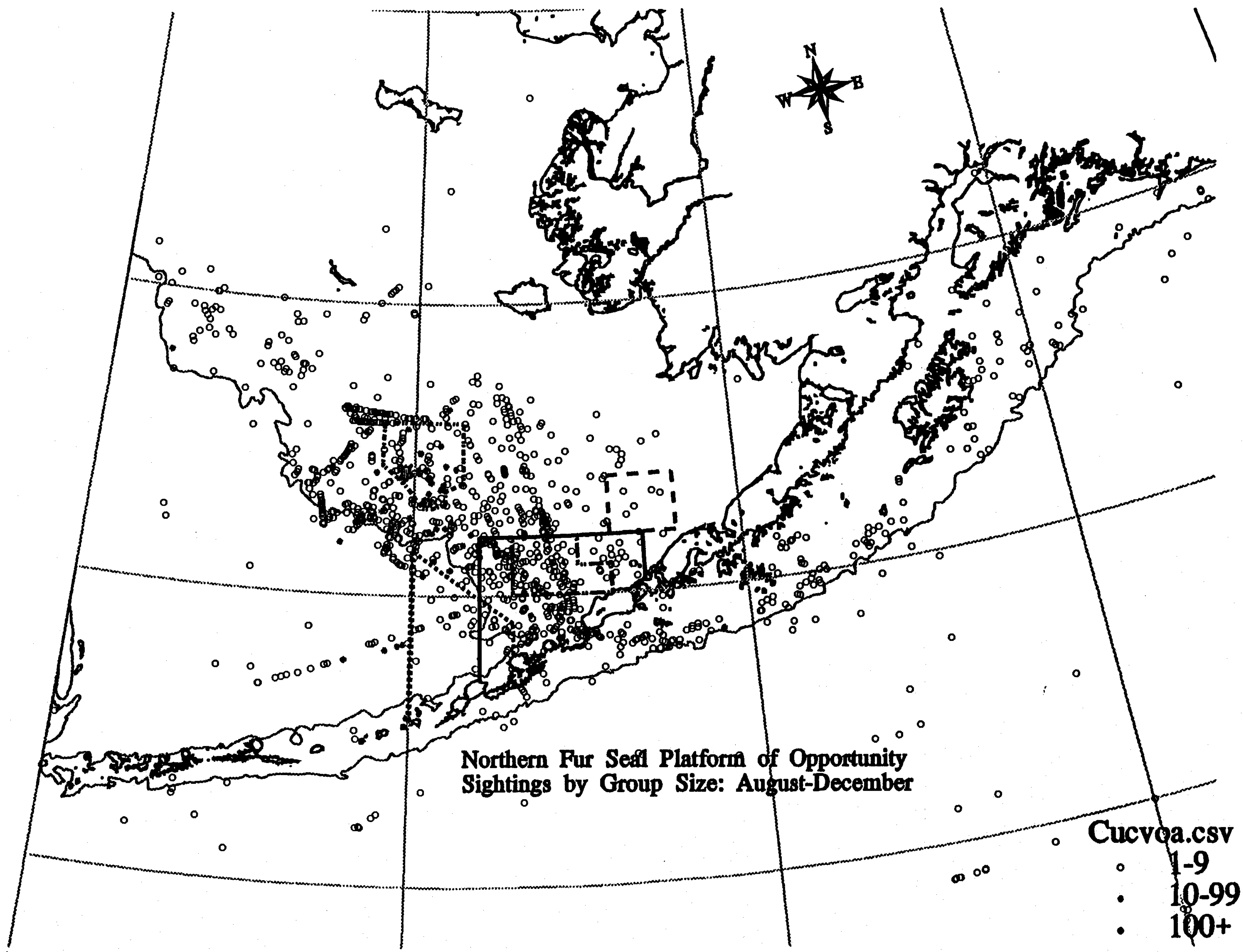

Northern Fur Seal Platform of Opportunity
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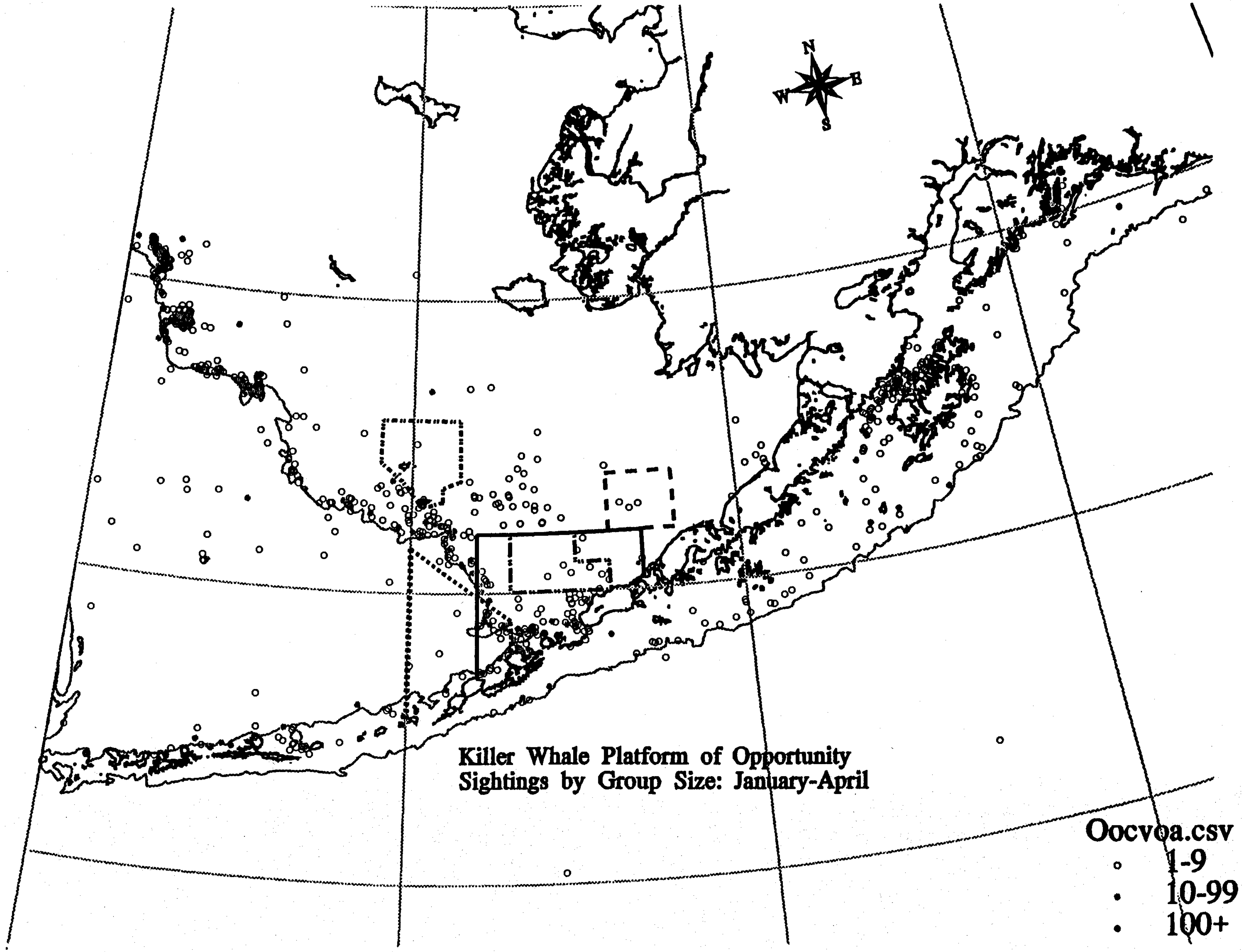
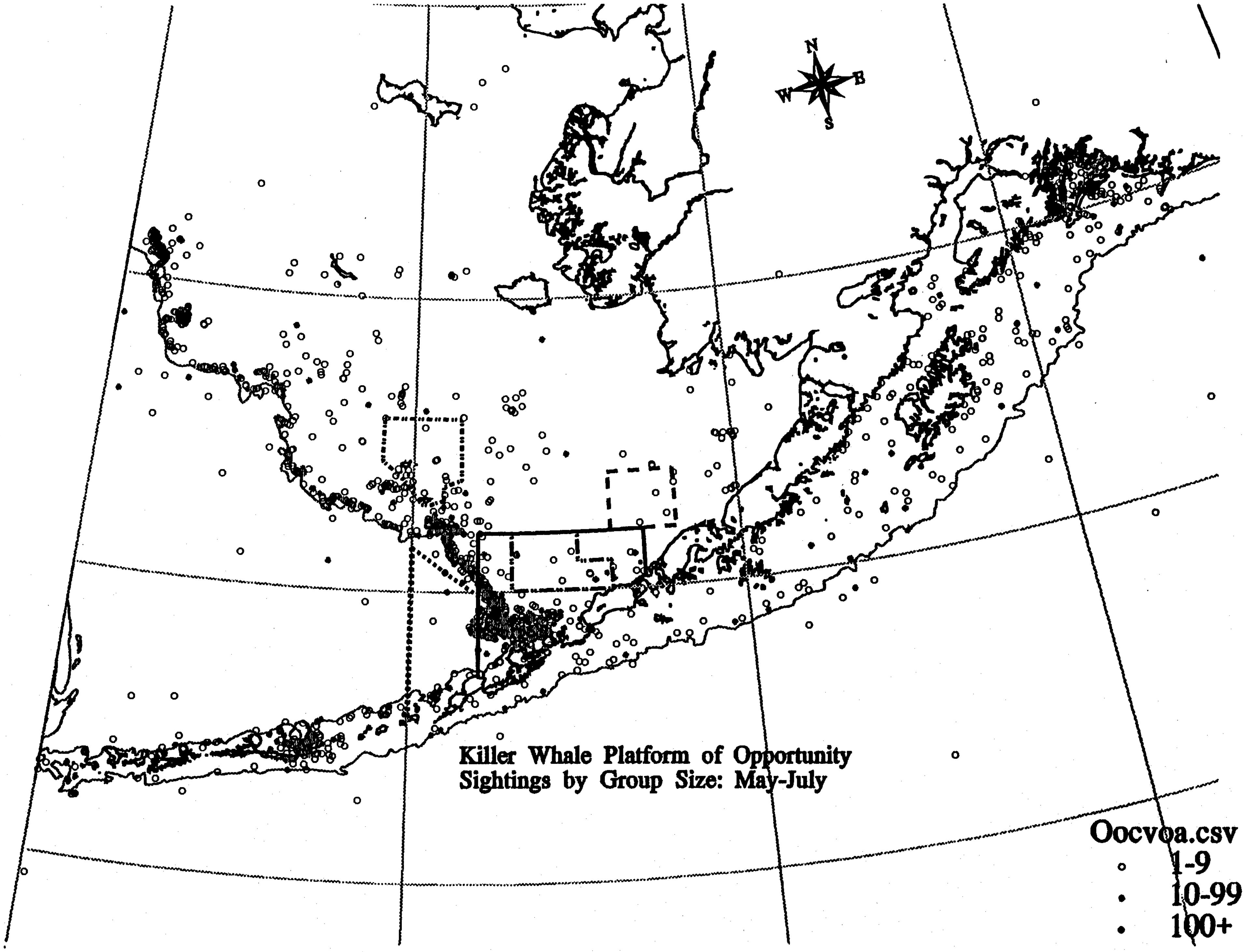
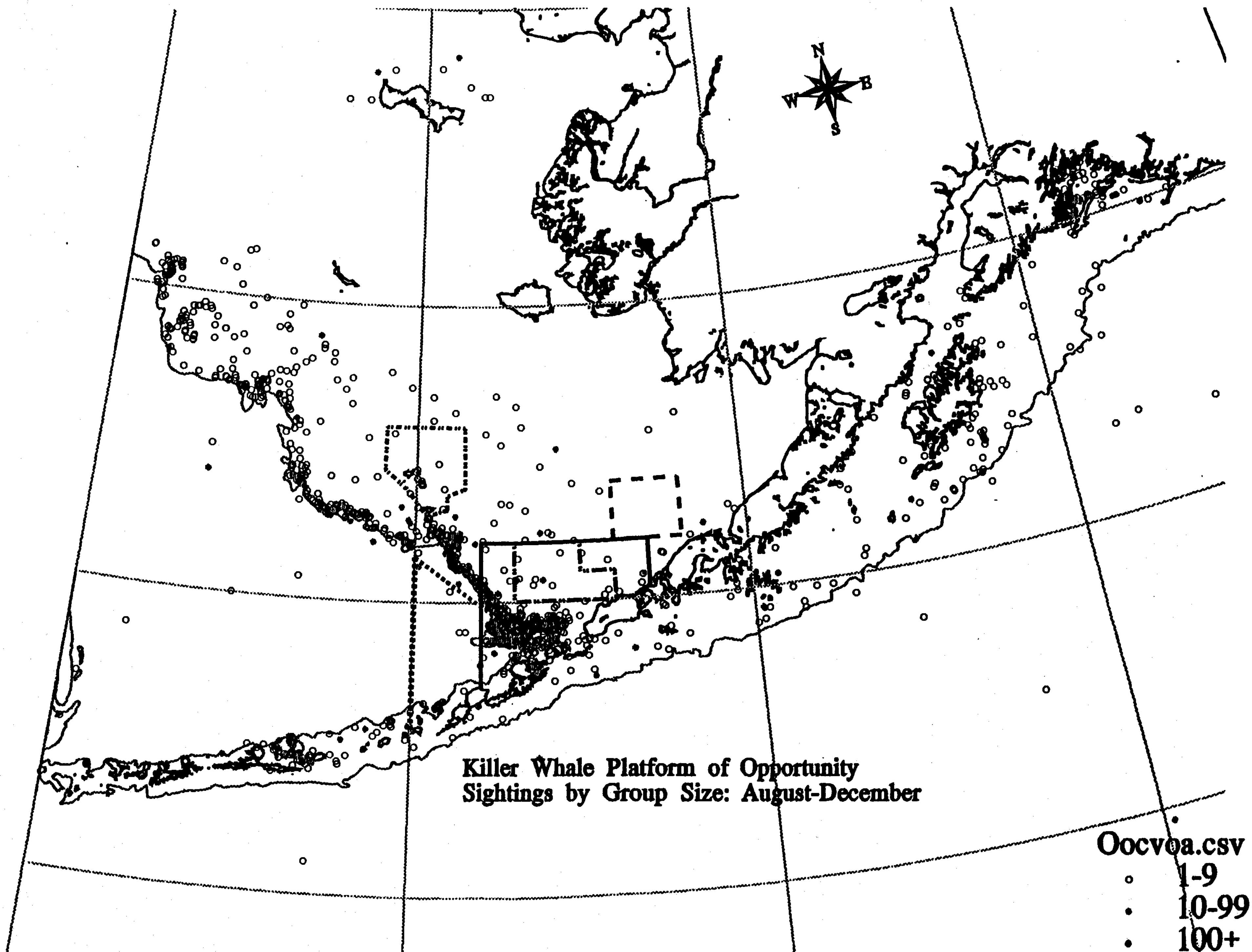
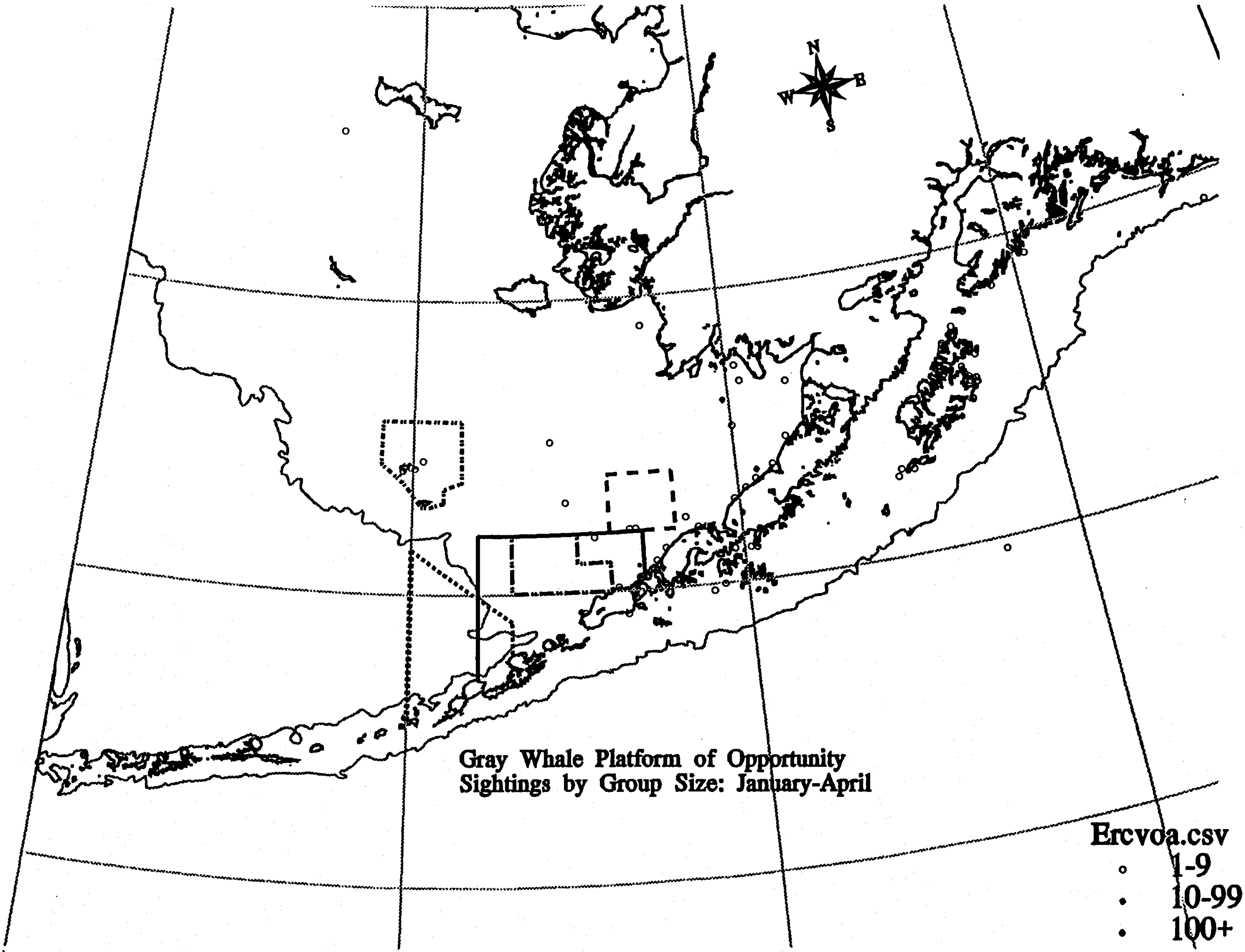

N
E
S
W
Killer Whale Platform of Opportunity
Sightings by Group Size: January-April
Oocvoa.csv
1-9
10-99
100+

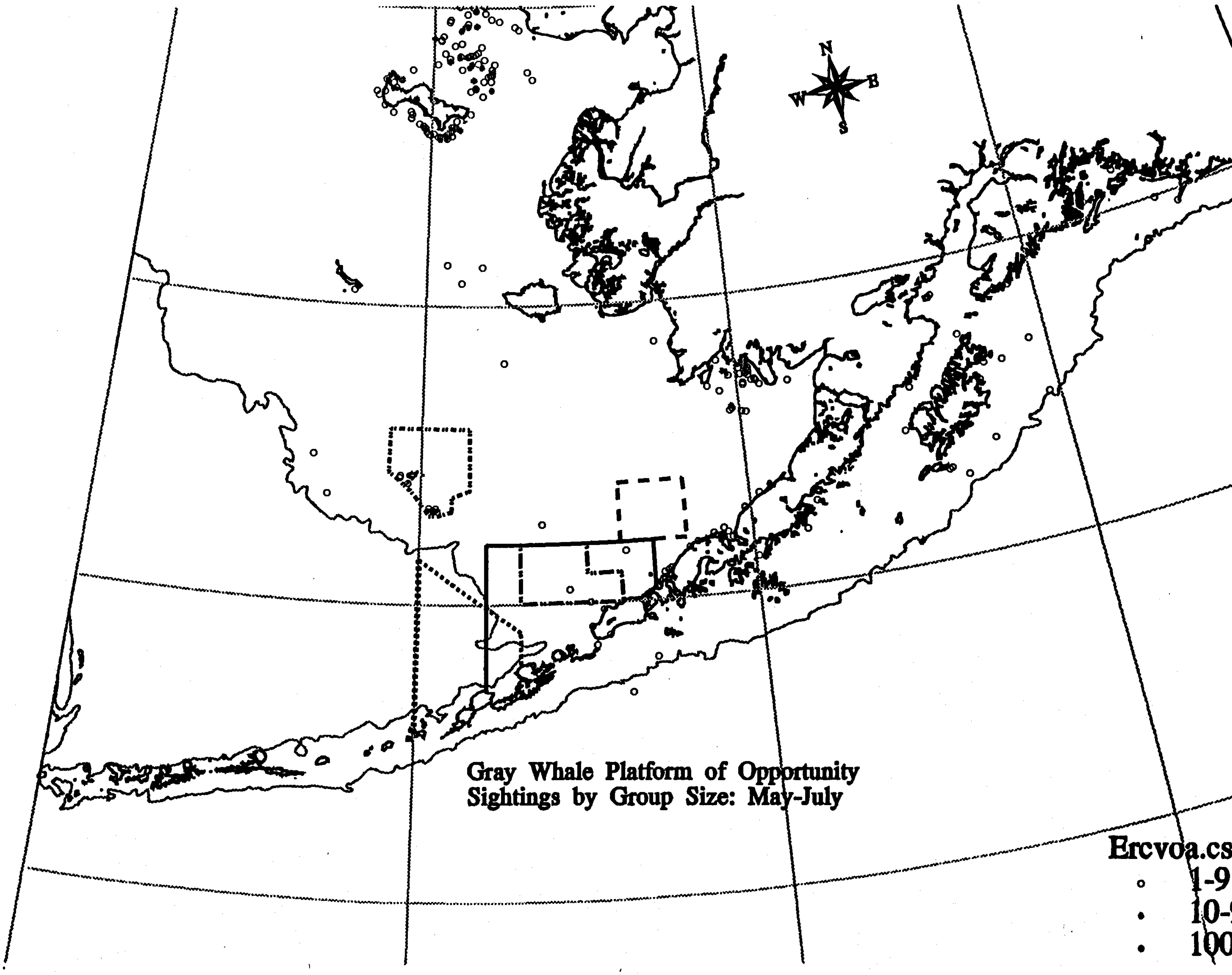


Killer Whale Platform of Opportunity
Sightings by Group Size: May-July

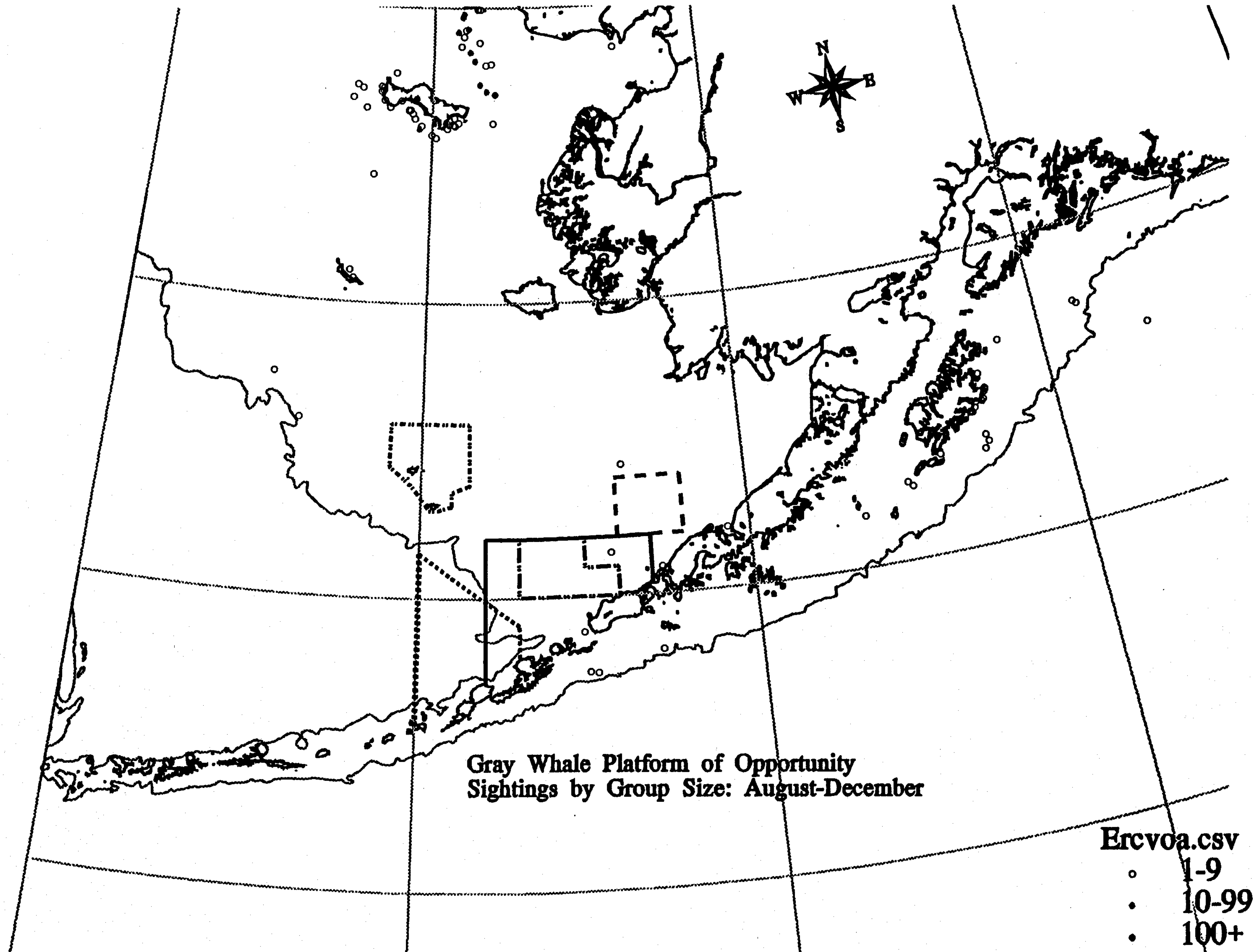


Killer Whale Platform of Opportunity
Sightings by Group Size: August-December


N
W
E
S
Gray Whale Platform of Opportunity
Sightings by Group Size: January-April
Ercvoa.csv
1-9
10-99
100+

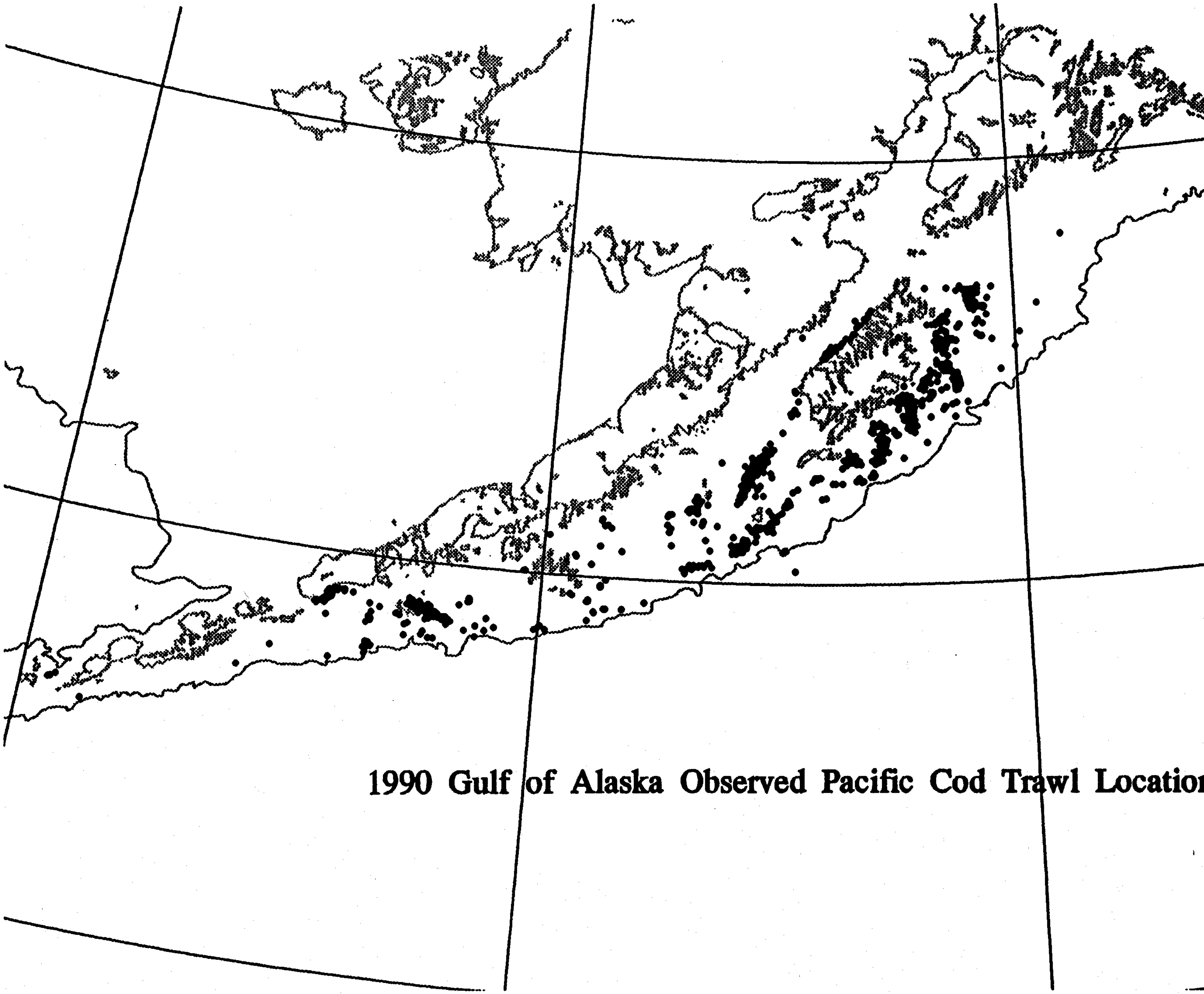


Gray Whale Platform of Opportunity
Sightings by Group Size: May-July

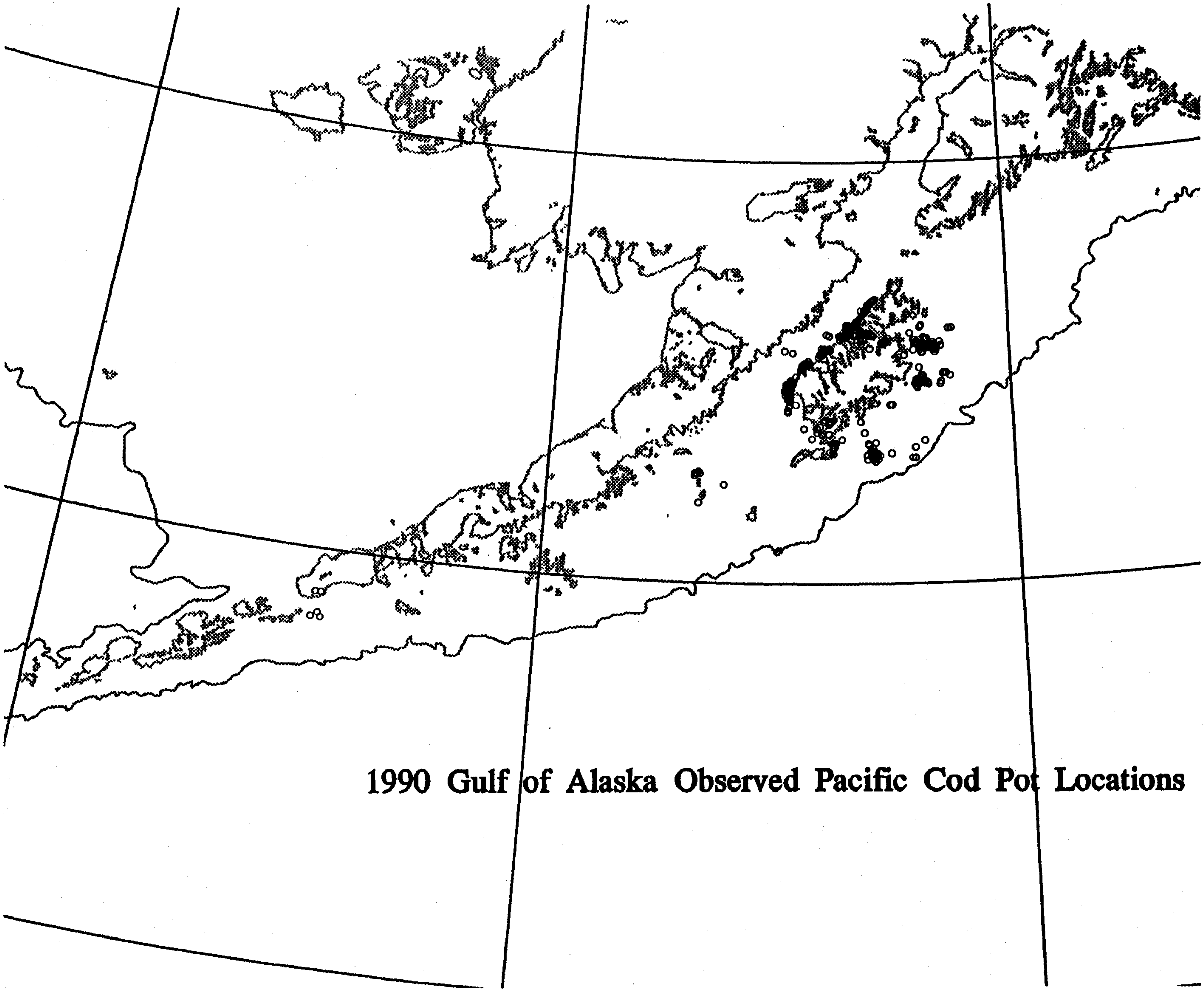

N
E
W
S
Gray Whale Platform of Opportunity
Sightings by Group Size: August-December
Ercvoa.csv
1-9
10-99
100+

Appendix III

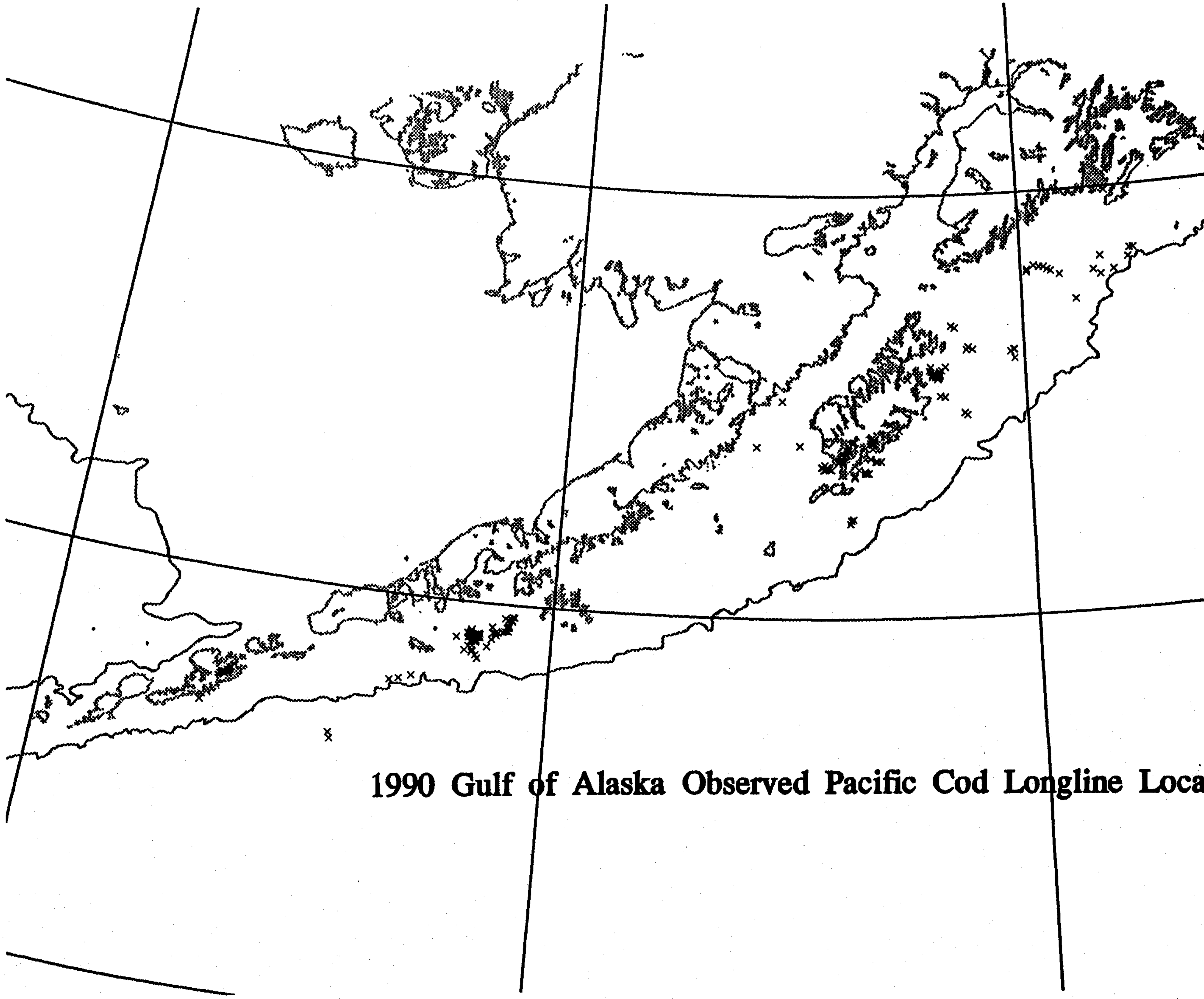
Observed bottom trawl, pot and longline locations of the Pacific cod fleet in the Gulf of Alaska, 1990-94.



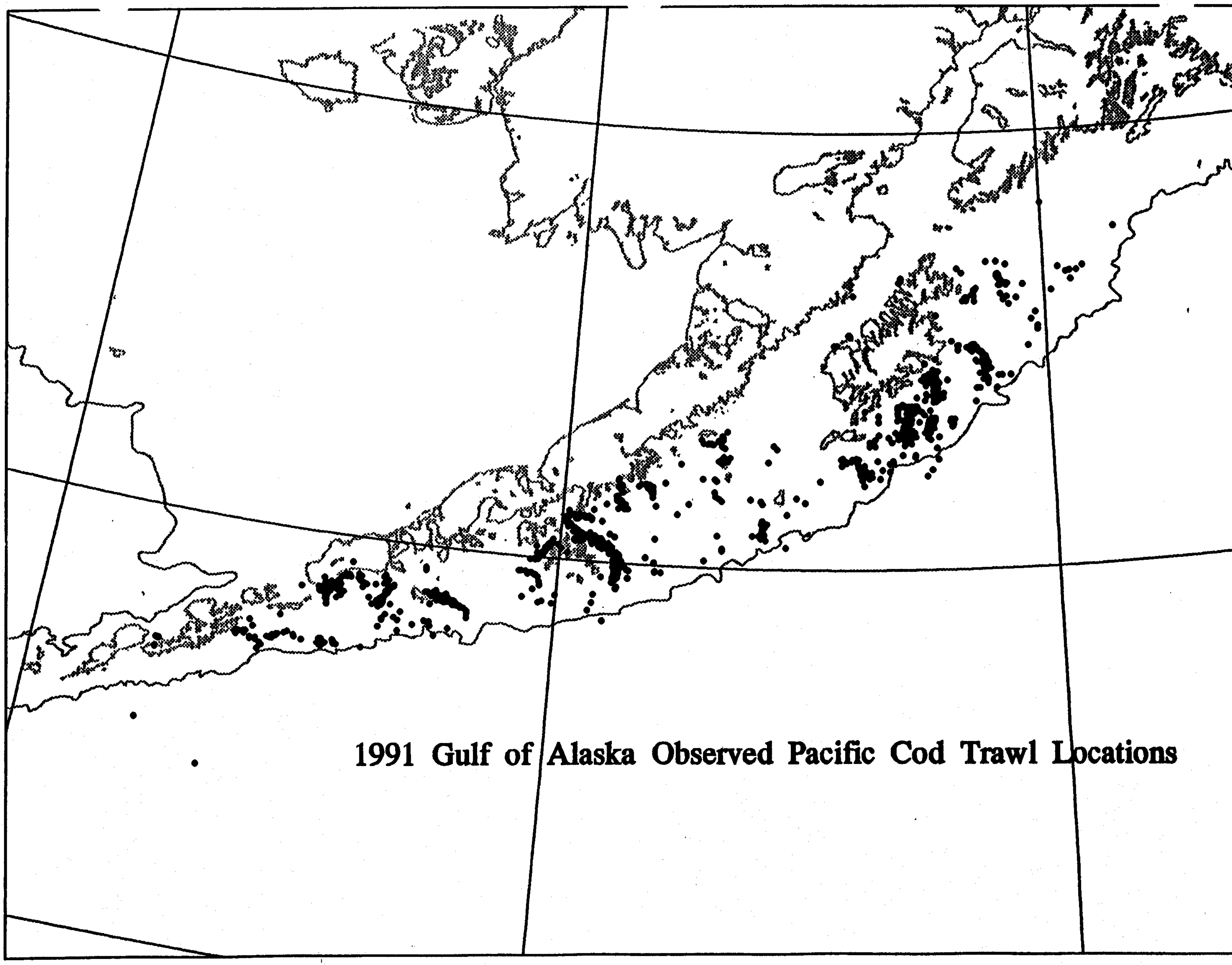
1990 Gulf of Alaska Observed Pacific Cod Trawl Locations



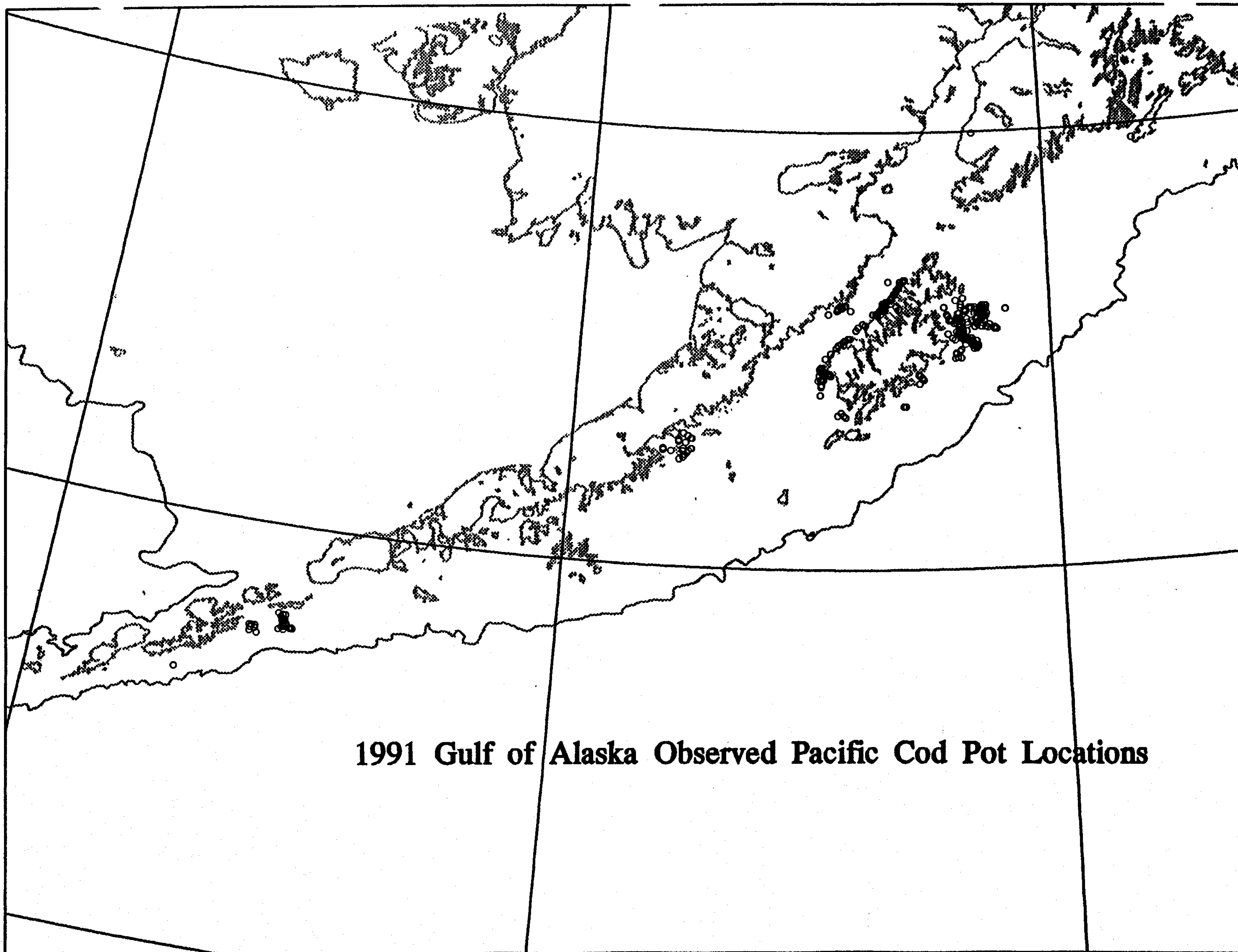
1990 Gulf of Alaska Observed Pacific Cod Pot Locations

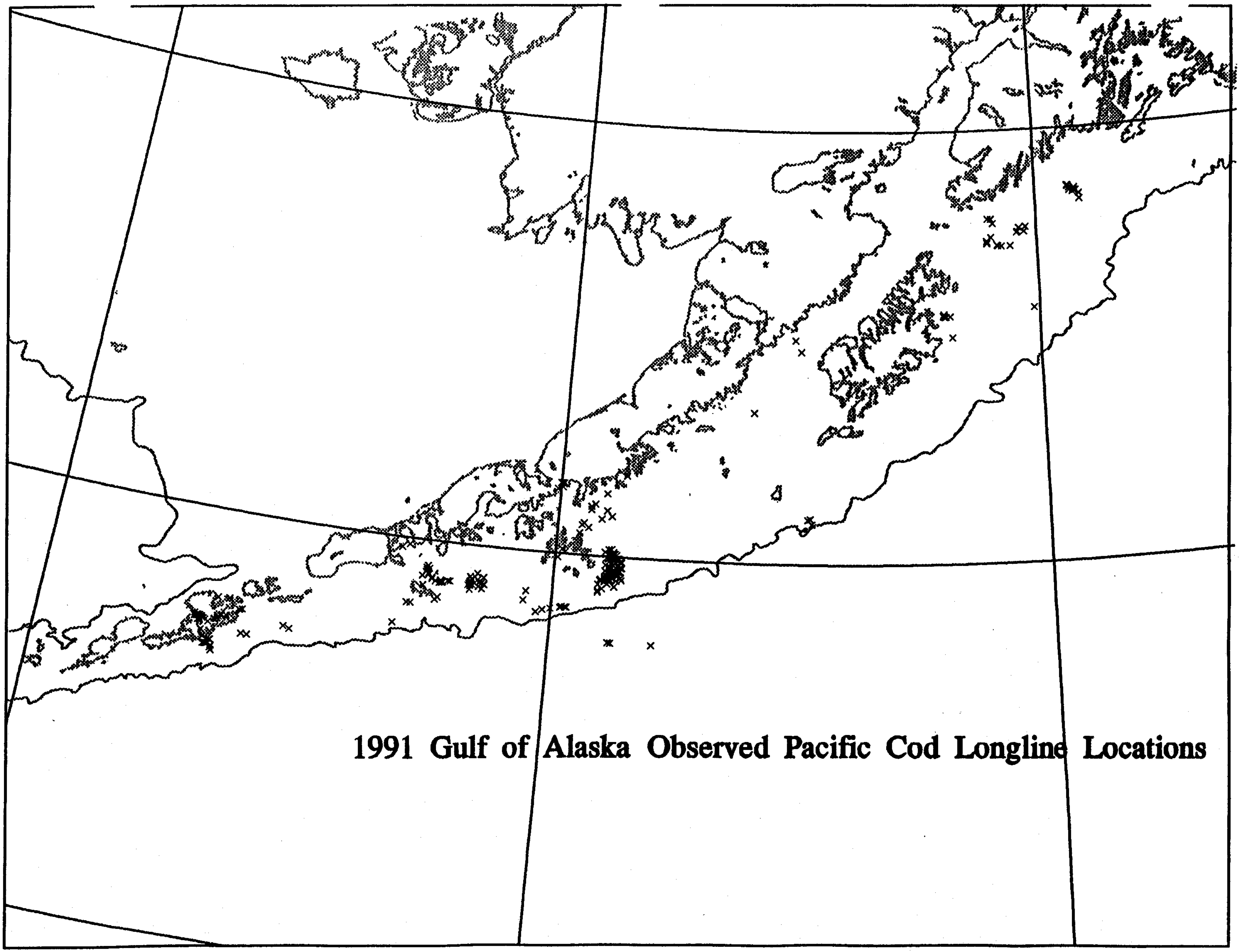


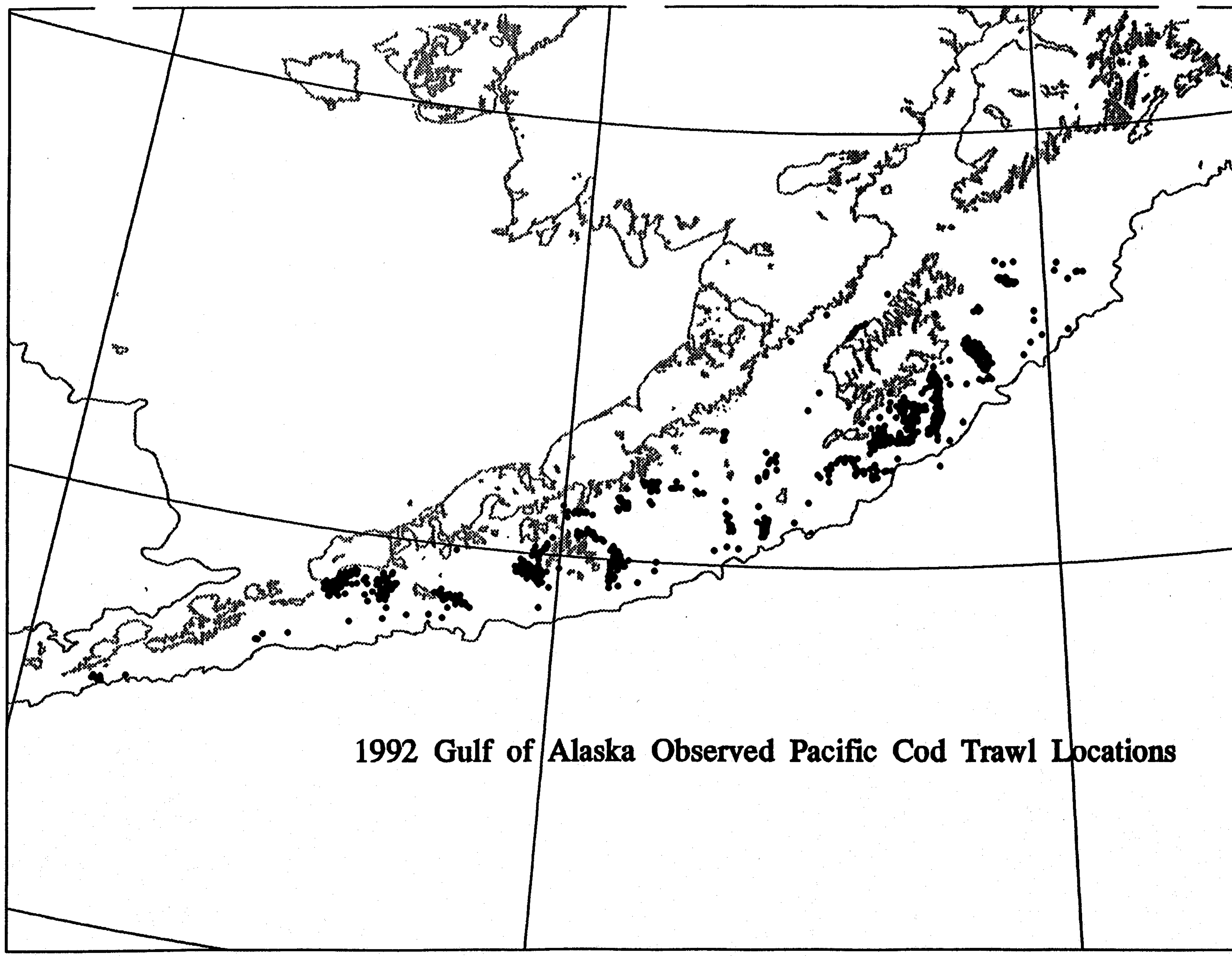
1990 Gulf of Alaska Observed Pacific Cod Longline Locations



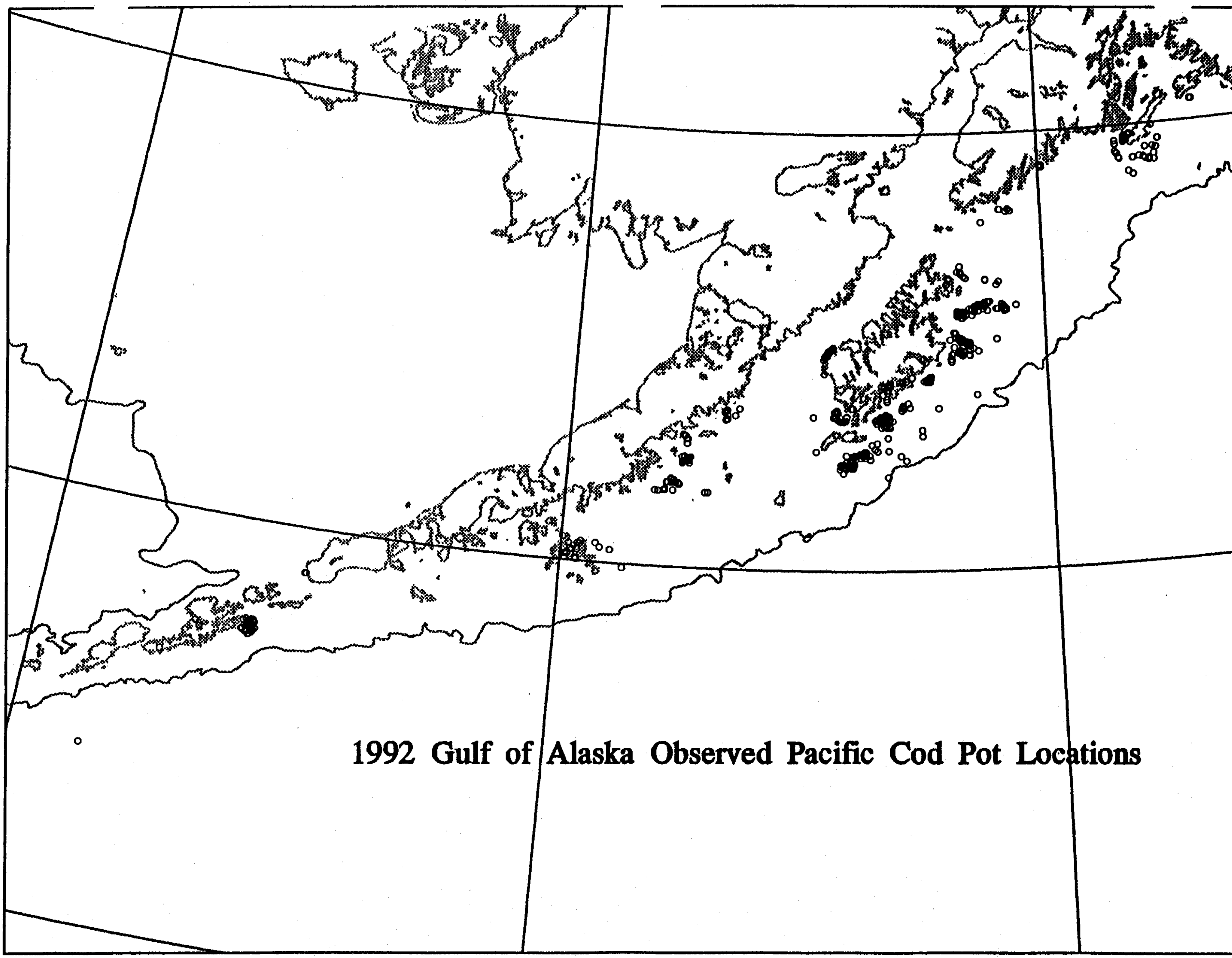
1991 Gulf of Alaska Observed Pacific Cod Trawl Locations

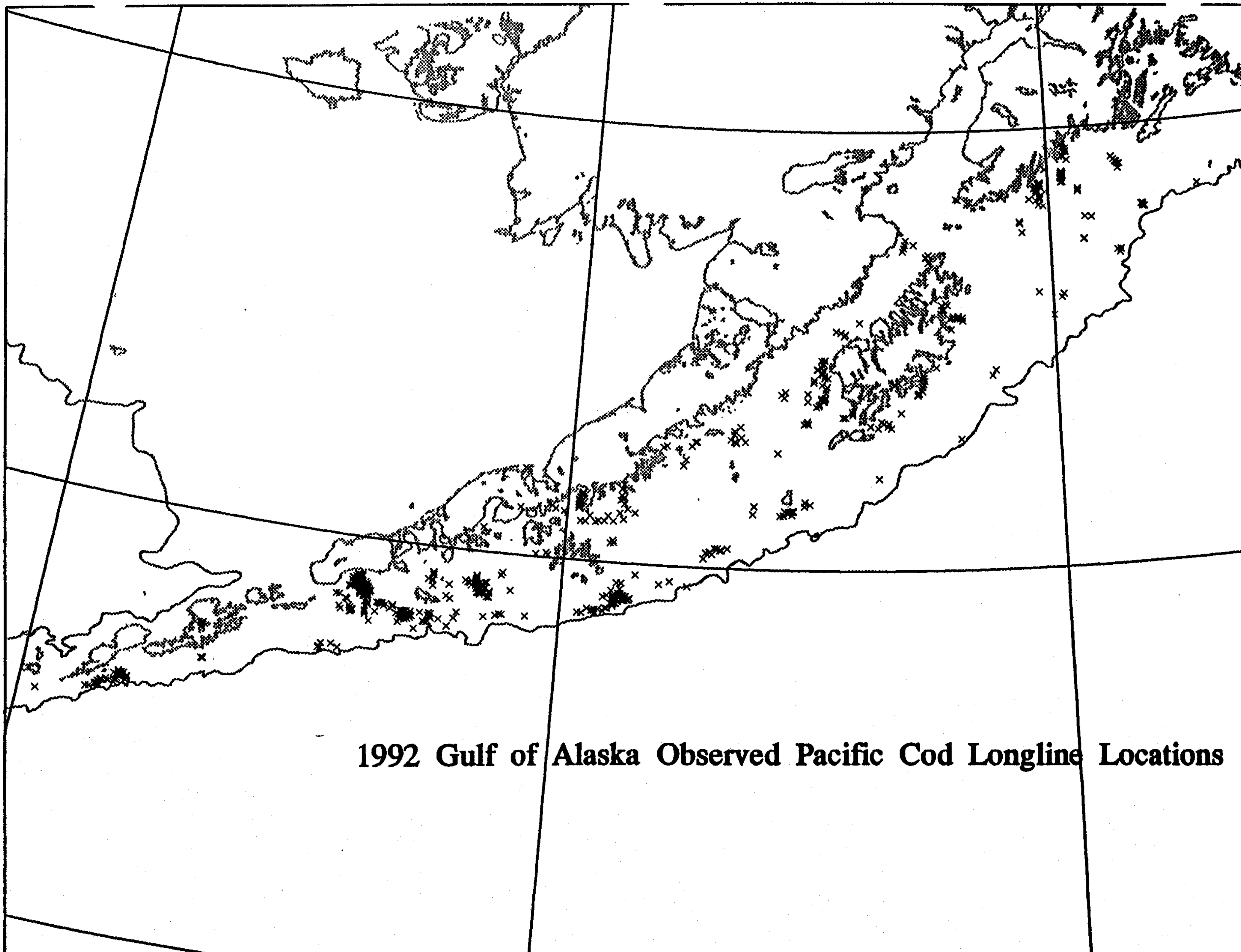

1991 Gulf of Alaska Observed Pacific Cod Pot Locations


1991 Gulf of Alaska Observed Pacific Cod Longline Locations

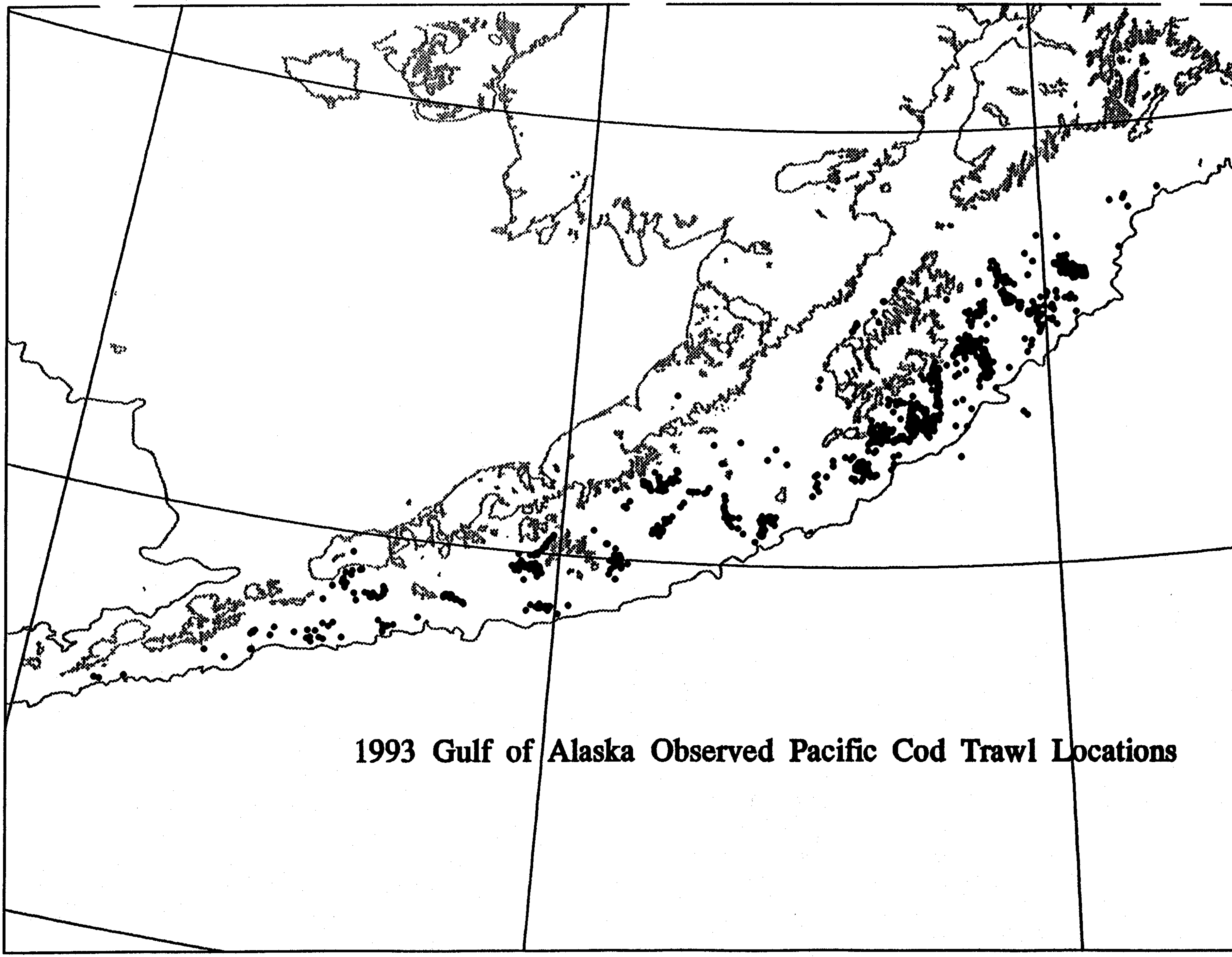


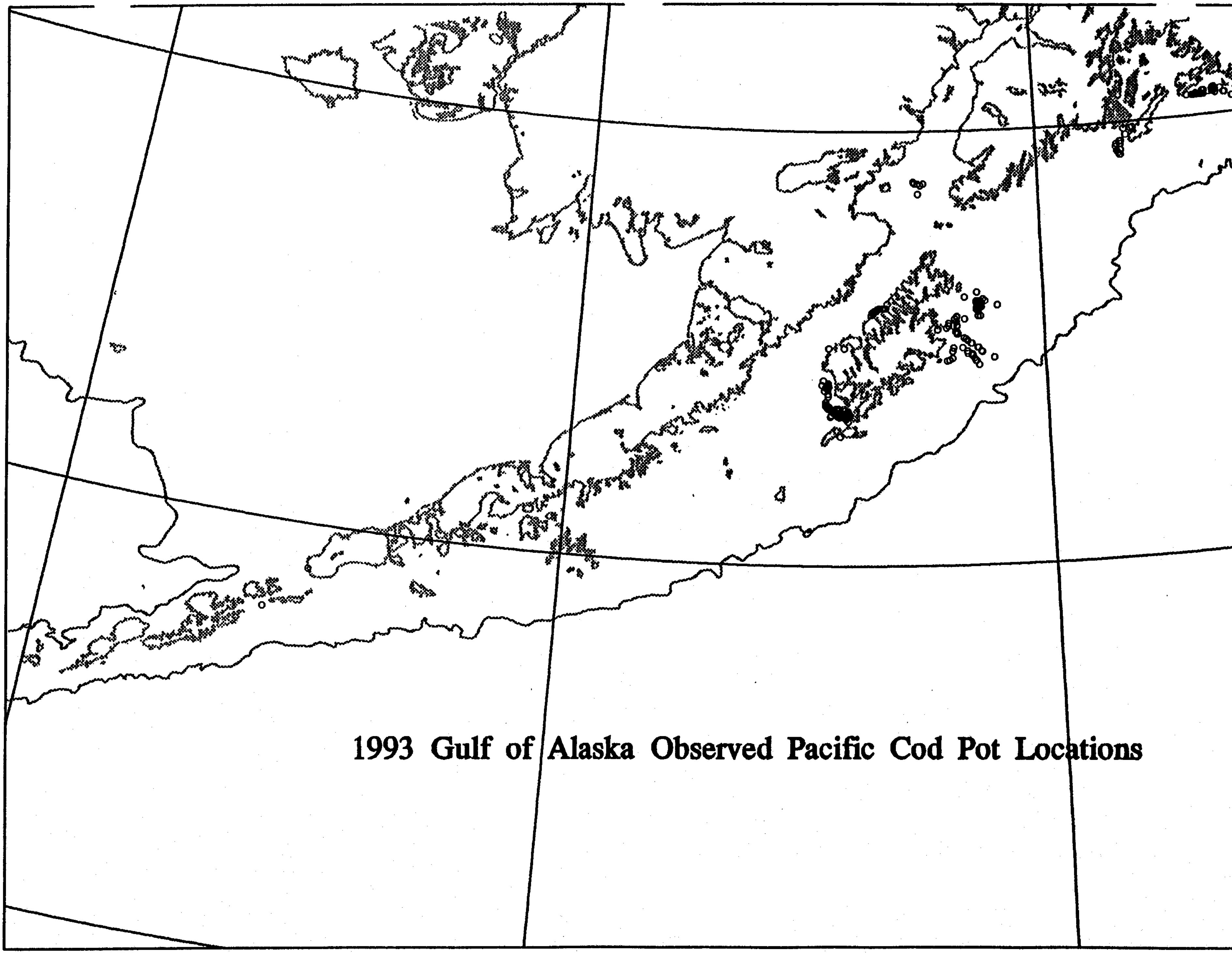
1992 Gulf of Alaska Observed Pacific Cod Trawl Locations


1992 Gulf of Alaska Observed Pacific Cod Pot Locations

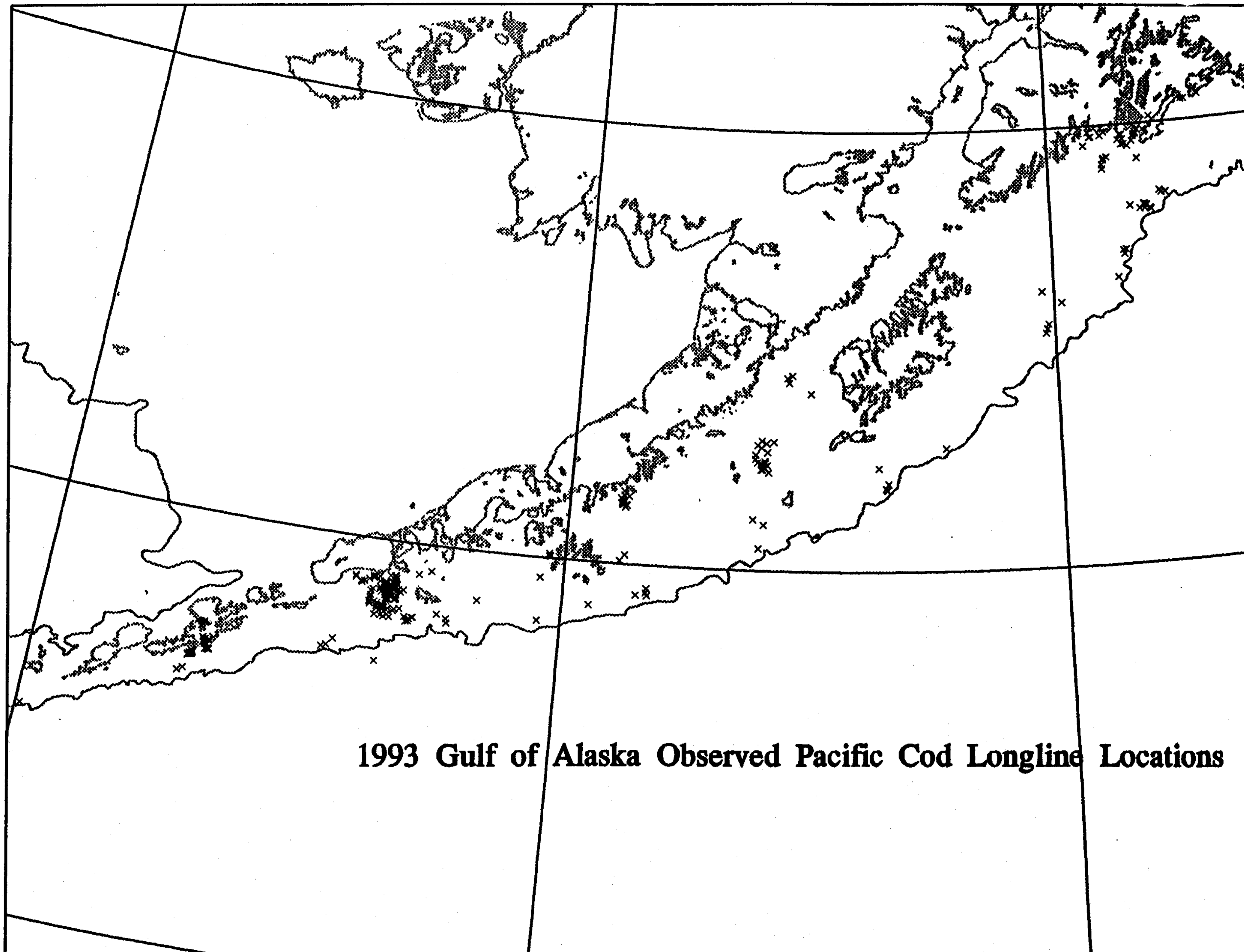


1992 Gulf of Alaska Observed Pacific Cod Longline Locations


1993 Gulf of Alaska Observed Pacific Cod Trawl Locations



1993 Gulf of Alaska Observed Pacific Cod Pot Locations



1993 Gulf of Alaska Observed Pacific Cod Longline Locations

Appendix IV
Pollock and Pacific Cod Processors, 1991 - 1994

During 1991-1994, over 300 processors reported Pacific cod or pollock landings in the EEZ of the North Pacific. This appendix contains a complete list of those processors. We have classified processors into different categories based on their physical attributes, processing capacities and activities. A similar classification scheme was used in the original analysis of the Inshore-Offshore Amendment and for harvesting vessels in the Licence Limitation Analysis.

Five different sets of data contain information regarding processors: (1) Fish Ticket data from ADF&G, (2) Blend Data and (3) Weekly Processor Reports from NMFS/AKR, (4) Observer Reports contained in the NORPAC database maintained by NMFS/AFSC, and Annual Groundfish Processing Reports currently compiled by NMFS Office of International Trade in Seattle. Unfortunately four different identification schemes are used in the various data sets, and matching these across sources is a difficult and time consuming process. The tables which follow present the available information on each processor reporting pollock or Pacific cod. For many of the identified processors we were unable to associate plant names or locations. This means that we may have double counted some processors as it is known that each agency does not always issue unique processor identifiers.

The appendix lists each identified processor in the category to which it was assigned. The following categories were used in this analysis.

Shore Plants: Shore based processing facilities have been categorized based on the physical location of the plant. We have divided these locations into six regions and have designated plants from these regions accordingly. These are shown below: A total of 109 different processors was categorized as shore-plants.

SP1 A category was established for shore-plants located in Western Alaska, excluding Dutch Harbor/Unalaska and Akutan. During the 1991-1994 period, however, no plants identified as SP1 reported processing pollock or Pacific cod.

SP2 Shore-plants located in the Pribilofs and Aleutian Islands, excluding Dutch Harbor/Unalaska and Akutan. During the 1991-1994 period, fewer than three plants from this region reported pollock or Pacific cod, therefore, they have been aggregated with the plants in SP3.

SP3 Shore-plants located in Dutch Harbor/Unalaska and Akutan. A total of 8 plants including those from SP2 processed pollock and Pacific cod during the period. This aggregate group is listed as SP23 in the remainder of the document.

SP4 Shore-plants located on the southern coast of the Alaskan Peninsula. During the period 1991-1994, a total of five processing facilities operated in this region. In some instances, we will combine these plants with other Gulf plants.

SP5 Shore-plants located on Kodiak Island or its environs. A total of 16 processors reported Pacific cod or pollock in this category.

SP6 Shore-plants located east of Kodiak including Cook Inlet, Prince William Sound and Southeast Alaska. A total of 49 plants reported pollock or Pacific cod in 1991-1994. Although the number of plants in this category is relatively large, their involvement in these particular fisheries is incidental for the most part.

UPP There were a total of 31 facilities which reported pollock or Pacific cod which we could not associate with a location or which only reported discards. We have categorized these as UPP standing for "unknown processing plant." These plants were designated as inshore because they reported catch using ADF&G processing identifying codes and did not have Federal Permits. These plants were insignificant participants but are included for completeness.

Motherships: As mentioned earlier, motherships could be designated as either inshore or offshore depending on whether the motherships chose to process at a single location inside Alaskan territorial waters. The classification scheme we have developed divided motherships between those that process crab (MP2) and those that do not (MP1). Some of the crab motherships (MP2) process limited amounts of pollock and Pacific cod and therefore, for this analysis, we have combined the two categories (MP12) although they represent vastly different capacities. A total of 35 motherships reported pollock and Pacific cod during the years 1991-1994. Of these, 14 were designated only as inshore motherships, 19 were strictly offshore, and 1 operated inshore in 1992 and offshore in 1993 and 1994.

Inshore Catcher-Processors: As mentioned earlier, catcher-processors less than 125' LOA which processed less than 18 mt of round-weight per day in their first week of participation in a directed pollock or Pacific cod in the Gulf were classified as inshore catcher-processors (ICP). A total of 46 vessels were classified as ICP during the 1991-1994 period. These vessels used a wide variety of gear, including trawls, longlines and pots, and may have logically been classified into other categories. In this report, we have classified them into a single category to facilitate reporting.

Pot Cod/Crab Processors: These vessels are all designated as offshore vessels and used pots to catch Pacific cod and crab. They may also have used hook and line gear, but have not reported using trawls. There were 20 vessels in this pot cod/crab processing (PCP) category during the year 1991-1994. Any vessel which might have fit this category, but participated in the inshore fisheries, was categorized as ICP.

Longline Processors: This category consists of freezer longliners which have not reported using pots or trawls to harvest fish or crab in the North Pacific. Any vessel which might have fit this category, but participated in the inshore fisheries, was categorized as ICP. There were 21 vessels in the longline processor (LP1) category during the 1991-1994 period.

Trawler Processors: We defined three categories of trawler processors based on their processing activities and capacities:

TP1: Vessels which reported processing significant amounts of surimi were classified in the trawler-processor 1 (TP1) category. There were 24 vessels in this category.

TP2: Vessels which reported processing significant amounts of fillets and were longer than 150' LOA were classified in the trawler-processor 2 (TP2) category. There were 16 vessels in this category. Length was included because the machinery for filleting generally requires vessels to be load-line stabilized. Some smaller vessels produced fillets, but usually much smaller amounts. We assumed these vessels to be filleting by hand.

TP3: These vessels all reported the use of trawl gear in the North Pacific. Many of these vessels have also reported the use of other gears such as longline and pots. These vessels produce primarily headed and gutted product and do not produce large amounts of fillets, and are generally less than 150' LOA. During the 1991-1994 period, 31 vessels fit into this category. Vessels which might have fit into this category, but which participated in the inshore sector, were classified as ICP.

	SP-23 - Shore Plants	ADF&G Vessel	Federal Permit	ADF&G Processor	Inshore/Offshore			
Class	Processor Name	Number	Number	ID	1991	1992	1993	1994
SP23	ALYESKA SEAFOODS, INC.			F0753	I	I	I	I
SP23	OSTERMAN FISH			F1764				I
SP23	QUEEN FISHERIES DBA EAST POINT SFD - DUTCH HARBOR			F0331		I	I	I
SP23	TRIDENT SEAFOODS CORP. - AKUTAN PLANT			F0939	I	I	I	I
SP23	UNIPAK CORP.			F1373	I	I		I
SP23	UNISEA, INC - DUTCH HARBOR FACILITY			F1180	I	I	I	I
SP23	WESTWARD SEAFOODS, INC.			F1366	I	I	I	I
SP23	UNKNOWN			F1500		I		
	SP4 - Shore-plants located on Southern Coast of the Alaskan Peninsula	ADF&G Vessel	Federal Permit	ADF&G Processor	Inshore/Offshore			
Class	Processor Name	Number	Number	ID	1991	1992	1993	1994
SP4	BARGE UNISEA			F0188	I	I	I	I
SP4	CHIGNIK PRIDE FISHERIES			F0365	I	I	I	
SP4	PETER PAN SEAFOODS, INC. - KING COVE			F0142	I	I	I	I
SP4	TRIDENT SEAFOODS CORP. - SAND POINT			F0940	I	I	I	I
SP4	UNKNOWN			F0622	I	I	I	
	SP5 - Shore-plants located on Kodiak Island	ADF&G Vessel	Federal Permit	ADF&G Processor	Inshore/Offshore			
Class	Processor Name	Number	Number	ID	1991	1992	1993	1994
SP5	ALASKA FRESH SEAFOODS, INC.			F0321	I	I	I	I
SP5	ALASKA PACIFIC SEAFOOD			F0210	I	I	I	I
SP5	COOK INLET PROCESSING			F1155	I	I	I	I
SP5	EMERALD ISLAND GOURMET SEAFOODS			F1053	I	I	I	I
SP5	FAROS SEAFOODS, INC			F1013	I	I	I	I
SP5	INTERNATIONAL SEAFOODS OF ALASKA			F0020	I	I	I	I
SP5	INTERNATIONAL SEAFOODS OF ALASKA			F0021	I	I	I	I
SP5	QUEEN FISHERIES DBA EAST POINT SFD - KODIAK			F0330	I	I	I	I
SP5	STAR OF KODIAK			F0222	I	I	I	I
SP5	WARDS COVE PACKING COMPANY - ALITAK PLANT			F0266	I	I	I	I
SP5	WARDS COVE PACKING COMPANY - PORT BAILEY			F0268	I	I		
SP5	WESTERN ALASKA FISHERIES INC.			F0320	I	I	I	I
SP5	UNKNOWN			F1325	I	I	I	
SP5	UNKNOWN			F1372	I	I	I	I
SP5	UNKNOWN			F1452		I	I	I

SP6 - Shore-plants East of Kodiak including Cook Inlet, Prince William Sound and SE Alaska.	ADF&G Vessel	Federal Permit	ADF&G Processor	Inshore/Offshore			
Processor Name	Number	Number	ID	1991	1992	1993	1994
ALASKA SEAFOOD CO., INC.		A955429	F0937		I	I	
ANNETTE ISLAND PACKING CO. COLD STORAGE		A955394	F9517	I	I	I	I
COOK INLET PROCESSING		A955364	F0186		I	I	I
DEEP CREEK CUSTOM PACKING, INC.		A955298	F1051	I	I	I	I
DRAGNET FISHERIES CO., INC. - KENAI PLANT		A955318	F0030	I	I	I	I
E.C. PHILLIPS & SON, INC.		A955376	F0110	I	I	I	I
FAVCO, INC.		A955383	F0398		I	I	I
HOONAH COLD STORAGE	44869	PA955335	F0777		I	I	I
INLET FISH PRODUCERS, INC.		A955466	F1231	I	I	I	I
INLET SALMON		A955419	F1039		I	I	
KACHEMAK FISH PACKERS		A955398	F1737				I
NORQUEST SEAFOODS INC		A955337	F1459		I	I	I
NORQUEST SEAFOODS INC		A955336	F1461		I	I	I
NORQUEST SEAFOODS INC			F1486				I
NORTH PACIFIC PROCESSORS		A955341	F0232	I	I	I	I
PETER PAN SEAFOODS, INC - VALDEZ		A955357	F1041	I	I	I	I
PETERSBURG FISHERIES		A955300	F0134	I	I	I	I
POINT ADOLPHUS SEAFOODS		A955301	F0306	I	I	I	I
S.E. AK. SMOKED SALMON CO., INC. - TAKU SMOKERIES		A955403	F0115		I	I	I
SAHALEE OF ALASKA, INC		A955304	F1485		I	I	I
SALAMATOF SEAFOODS, INC		A955460	F0037		I	I	I
SAMER-I SEAFOODS		A955465	F1168		I		
SEAFOOD PRODUCER COLD STORAGE INC		A955371	F1206		I	I	I
SEWARD FISHERIES		A955332	F0133	I	I	I	I
SEWARD FISHERIES		A955299	F0135	I	I	I	I
SITKA SOUND SEAFOODS		A955346	F0147	I	I	I	I
SITKA SOUND SEAFOODS, INC.		A955359	F0900	I	I	I	I
SPECIALTY FISH PRODUCTS		A955354	F0983	I	I	I	I
WARDS COVE PACKING COMPANY - EXCURSION INLET		A955409	F0274		I	I	I
WARDS COVE PACKING COMPANY - SEWARD		A955438	F1379		I	I	I
WRANGELL FISHERIES, INC.			F0319		I	I	
UNKNOWN			F0120	I	I	I	
UNKNOWN			F0132	I	I		
UNKNOWN			F0172	I	I	I	I
UNKNOWN			F0223	I	I	I	
UNKNOWN			F0394	I	I	I	
UNKNOWN			F0409	I			
UNKNOWN			F0597		I		
UNKNOWN			F0709	I	I		
UNKNOWN			F0815	I			
UNKNOWN			F1171	I	I	I	I
UNKNOWN			F1202		I	I	
UNKNOWN			F1267		I	I	I
UNKNOWN			F1300	I			
UNKNOWN			F1301	I	I	I	
UNKNOWN			F1439			I	I
UNKNOWN			F1454			I	I
UNKNOWN			F1455		I	I	I
UNKNOWN			F1512		I		

ICP - Inshore Catcher-Processors	ADF&G Vessel	Federal Permit	ADF&G Processor	Inshore/Offshore			
Processor Name	Number	Number	ID	1991	1992	1993	1994
ALASKA CHALLENGE	39113	PA954285	F3911		O		O
ALASKA PREDATOR	48183	PA953367	F9574	O	O		
ALASKAN SHORES	38332	PA954583				I	I
ALLIANCE	55045	PA952924	F1357	O	O	I	I
AMERICAN CHALLENGER	62152	AK954120	F1408	O	O	I	
AUGUSTINE	42232	PA953093				I	I
BLUE FIN	62841	PA955040					I
BLUE ICE	49527	PA952402	F9615	O	O	I	I
BOUNTY HUNTER	63975	AK944961	F9687		O	I	I
CLIPPER ENDEAVOR	56602	PA953242	F9559	O	O	I	I
CLIPPER SURPRISE	54743	PA952718	F9538	O	O	I	I
DEFENDER	62545	PA954635			O	I	I
EAGLE	59718	PA954013	F9631	O	O	I	I
FAITH	27326	PA950568	F0728		O		
GOLDEN FLEECE	43260	PA950367	F1361	O	O	I	
GOLDEN PISCES	32817	PA950586	F9614	O	O	I	I
GRIZZLEY	50501	AK954178				I	
GUARDIAN	61571	AK954627					I
GULF MAIDEN	12796	PA951591	F1469		O	I	I
HARMONY	46970	AK940638	F9638	O	O	I	I
ICY POINT	64500			I			I
JUDI B	00014	PA951695	F9520	O	O	I	I
KEMA-SUE	41033	PA951701	F9701		I	I	I
KIMBERLY DAWN	59651	AK944691			I		
KJEVOLJA	39369	PA951632	F9599	O	O	I	I
KRUZOF	55526	PA952277	F1342	O	O	I	I
MARIA N	59376	PA953692	F1228	O	O	I	I
MELISSA BETH	57775	PA953397	F1154	O	O	I	I
NORTH STAR	06469	AK940948	F9652	O	O	I	I
PACIFIC BREEZE	32205	PA953700	F9608	I			
PACIFIC MONARCH	63333	AK954540	F9681		O	I	O
PHOENIX	52963	AK932855				I	
PROWLER	40920	PA951622	F9555	O	O	I	I
REBECCA B	56162	PA952817	F1137	O	O	I	I
RESPONSE	58538	AK934209	F9661	O	O	I	
SEA POWER	63511	PA954650	F1463		O	I	I
SEADAWN	00077	AK952059				I	
SILVER ICE	20817	PA953585	F9595	O	O	I	I
SONNY BOY	39270	AK922537	F9641	I			
SONYA S	61244	PA954131	F1371	O	O	I	I
ST. JUDE	61647	AK944210	F1449		O		O
SUNDANCER				O	O	I	I
T-MIKE	59837	AK944616			O		
VAERDAL	01119	PA952123	F9600	O	O	I	I
WILD THING	41215	AK944284	F9650	O	O	I	
ZENITH	41010	PA950440	F9598	O	O	I	I

LP-1 - Longline Processors	ADF&G Vessel	Federal Permit	ADF&G Processor	Inshore/Offshore			
Processor Name	Number	Number	ID	1991	1992	1993	1994
ALASKA MIST	54851	PA952833	F1042	O	O	O	O
ALASKA PATRIOT	52813	PA953816	F9627	O	O	O	O
ALASKA PIONEER	56980	PA953308	F1517	O	O	O	O
ALASKAN LEADER	62437	PA954598	F9668	O	O	O	O
BEAUTY BAY	60100	PA954533		O	O	O	O
DEEP PACIFIC	56016	PA952872	F9549	O	O	O	O
DIAMOND STAR	56984	PA953363	F1571		O	O	O
EMERALD QUEEN	59812	AK933787	F9623	O	O	O	
FISH	59154	AK944612	F9674		O	O	O
FRONTIER MARINER	59380	PA953672	F9613	O	O	O	O
FRONTIER SPIRIT	59381	PA953673	F9610	O	O	O	O
LIBERTY BAY	62905	PA954618	F9672		O		O
LILLI ANN	63484	PA954569	F9664	O	O	O	O
NEW STAR	58005	PA953491	F9606		O	O	O
OCEAN PROWLER	43570	PA953336	F9618	O	O	O	O
PACIFIC PEARL	31068	PA950276	F9685		O		
PATHFINDER	61538	PA954306	F9651	O	O	O	O
SEATTLE STAR	41040	PA952008	F9534	O	O	O	O
STORFJORD	50226	PA954529					O
YUKON PRINCESS	38549	PA954463	F9654	O	O	O	O
YUKON QUEEN	58510	PA953616	F9602	O	O	O	

PCP - Pot/CodCrab Processors	ADF&G Vessel	Federal Permit	ADF&G Processor	Inshore/Offshore			
Processor Name	Number	Number	ID	1991	1992	1993	1994
ALASKAN ENTERPRISE	32728	PA953006	F1291	I			
ALEUTIAN LADY	56126	PA954102	F9596	O	O	O	O
ARCTIC ORION	56155	AK943686	F1436	O	O		
ATKA ENTERPRISE	62911	PA954629	F1536		O		
BARANOF	34855	PA951248	F9557	O	O	O	O
BERING EMPIRE	59501	AK943858	F1239	O	O		
COURAGEOUS	35833	PA951276	F9556	O	O	O	O
DEEP SEA HARVESTER	54822	PA952815	F0997	O	O		
DIOMEDES	57320	AK923395	F1136	O			
EASTBOUND ONE	62255	AK924183		O	O		
GULF WIND	08522	PA950372	F1441		O		
KARLA FAYE	62525	PA954520	F1564	O			
KISKA ENTERPRISE	54865	PA953376	F1523		O		
NORTHERN ENTERPRISE	53764	PA953005	F1293		O	O	
OLYMPIC	56174	PA952834	F1271	O	O		
PAVLOF	37374	PA953406	F1551		O		O
PERSEVERANCE		AK913355	F1031	O			
SJOVIND	56963	AK943990	F1382		O	O	
SOUTHERN WIND	40921	PA951696	F1535		O		
WESTERN ENTERPRISE	56139	PA953268	F1292		O		

MP-12 - Mothership Processors	ADF&G Vessel	Federal Permit	ADF&G Processor	Inshore/Offshore			
Processor Name	Number	Number	ID	1991	1992	1993	1994
ALASKAN 1	41498	PA953532	F1147	O			
ALASKAN EIGHT	00075	AK924669	F1466		O		
ALL ALASKAN	57628		F1157	I	I	I	
ARCTIC ENTERPRISE	57104	AK923730	F1132	I	I	I	I
ARCTIC STAR	37268		F0138		I		
ATLAS	58265	PA954009	F9657	O	O		O
BARGE HARVESTER	41106		F0051	I			
BERING STAR	37267	PA953531	F0137		O	O	
BRISTOL MONARCH	41569		F1237	I			
BROOKS ALASKAN SEAFOOD	29002	PA955360	F1108		I	I	I
DISCOVERY STAR	51971		F1142		I	I	
DONA KAREN MARIE	61319	AK924107	F1377	O	O		
EXCELLENCE	60958	PA954111	F1333	O	O	O	O
FORT YUKON	56566		F0368	I			
GOLDEN ALASKA	52929	PA951607	F9516	O	O	O	O
MIDAS	50553	PA953228	F0943	O			
NEW WEST FISHERIES, INC.	46069	PA955400	F0602	I	I	I	
NORTHERN ALASK	53689		F0864	I	I		
NORTHERN VICTOR	60507	PA954078	F1319	I	I	I	I
NUSHAGAK				O	O		
OCEAN PHOENIX	59463	PA953703	F1608	O	O	O	O
OCEAN PRIDE	59595	PA954319	F1263	O			
OMNISEA	55159		F1066			I	
PACIFIC PRODUCER	55287	AK924686	F0923	O	O	O	
PALISADES	40547	AK923852	F1254	O	O		
PENGURA EN	27699		F1458			I	
POLAR QUEEN	51651	AK934104	F1165	O	O	I	I
ROYAL ALEUTIAN SEAFOODS, INC.		PA955313	F1093	I		I	I
SEA GYPSY	35760	AK944364					O
SEABOARD BARGE(EX:SHERRIE)	61216	AK914109	F1363	I			
SNOPAC	57605	PA953592	F1146	O			O
SPEEDWELL	46714	AK932329	F9552	O	O		
WESTERN SEA	50552	PA953590	F1256	O	O		
WOODBINE	43770	AK934152	F0214	O	O		
YARDARM KNOT	53677	PA953116	F0786		O		O

TP1 -Trawl Processors	ADF&G Vessel	Federal Permit	ADF&G Processor	Inshore/Offshore			
Processor Name	Number	Number	ID	1991	1992	1993	1994
ALASKA OCEAN	60407	PA953794	F9619	O	O	O	O
ALEUTIAN SPEEDWELL	54852	PA952850	F9550	O	O	O	O
AMERICAN DYNASTY	59378	PA953681	F9605	O	O	O	O
AMERICAN EMPRESS	57623	PA953408	F9588	O	O	O	O
AMERICAN TRIUMPH	60660	PA954055	F9633	O	O	O	O
ARCTIC FJORD	57450	PA953396	F9597	O	O	O	O
ARCTIC STORM	54886	PA952943	F9539	O	O	O	O
ARCTIC TRAWLER	39798	PA952733	F9536	O	O	O	O
CLAYMORE SEA	57373	PA953362	F9583	O	O	O	O
ENDURANCE	57201	PA953360	F9563	O	O	O	O
HEATHER SEA	57846	PA953664	F9592	O	O	O	O
ISLAND ENTERPRISE	59503	PA953870	F9625	O	O	O	O
KODIAK ENTERPRISE	59170	PA953671	F9603	O	O	O	O
NORTHERN EAGLE	56618	PA953261	F9558	O	O	O	O
NORTHERN GLACIER	48075	PA950661	F0181	O	O	O	O
NORTHERN HAWK	60795	PA954063	F9630	O	O	O	O
NORTHERN JAEGER	60202	PA953896	F9622	O	O	O	O
OCEAN ROVER	56987	PA953442	F9616	O	O	O	O
PACIFIC GLACIER	56991	PA953357	F9575	O	O	O	O
SAGA SEA	60169	PA954056	F9626	O	O	O	O
SEATTLE ENTERPRISE	56789	PA953245	F9554	O	O	O	O
STARBOUND	57621	PA953414	F9589	O	O	O	O
U.S. ENTERPRISE	55125	PA953004	F9542	O	O	O	O
VALIANT	56196	PA952839	F9548	O	O	O	O

TP2 -Trawl Processors	ADF&G Vessel	Federal Permit	ADF&G Processor	Inshore/Offshore			
Processor Name	Number	Number	ID	1991	1992	1993	1994
AMERICAN ENTERPRISE	54836	PA952760	F9540	O	O	O	O
BRISTOL ENTERPRISE	54392	PA952800	F9544	O	O	O	O
BROWNS POINT	55511	PA952726	F1384	O	O	O	O
HARVESTER ENTERPRISE	55183	PA952732	F9533	O	O	O	O
HIGHLAND LIGHT	56974	PA953348	F9643	O	O	O	O
NORTHWEST ENTERPRISE	36808	PA953002	F1524	O	O	O	
OCEAN ENTERPRISE	51073	AK953011	F1527	O	O	O	
OCEAN PEACE	55767	PA952134	F9528	O	O	O	O
PACIFIC ENTERPRISE	50759	PA953010	F1528	O	O	O	
PACIFIC EXPLORER	57629	PA953416	F9587	O	O	O	O
PACIFIC NAVIGATOR	54859	PA952799	F1572	O	O	O	O
PACIFIC SCOUT	57438	PA953383	F9581	O	O	O	O
ROYAL KING	56197	PA952838	F9547	O	O	O	O
ROYAL SEA	55301	PA951996	F9522	O	O	O	O
SNOW KING	54637	PA952722	F9541	O	O	O	O
UNIMAK ENTERPRISE	57211	PA953369	F9586	O	O	O	O

TP3-Trawler Processor	ADF&G Vessel	Federal Permit	ADF&G Processor	Inshore/Offshore			
Processor Name	Number	Number	ID	1991	1992	1993	1994
ALASKA I	51925	PA951310	F1518	O	O	O	O
ALASKA JURIS	54693	PA952443	F9552	O	O	O	O
ALASKA RANGER	57444	PA953400	F9591	O	O	O	O
ALASKA SPIRIT	59870	PA953819	F9676	O	O	O	O
ALASKA VICTORY	61083	PA954093	F9636	O	O	O	O
ALASKA VOYAGER	51926	PA951311	F9512	O	O	O	O
ALASKA WARRIOR	56965	PA953423	F1499	O	O	O	O
ALASKAN ROSE	55466	PA952018	F9530	O	O		O
AMERICAN CHAMPION	00049	PA952974				O	O
AMERICAN NO. 1	36202	PA951879	F9521	O	O	O	O
ARCTURUS	45978	AK950533		O			
ARICA	57228	PA953694	F9573	O	O	O	O
BERING ENTERPRISE	36502	PA953003	F9519	O	O	O	O
BLUE NORTH	41977	PA953339	F1149		O	O	O
CAPE HORN	55921	PA952110	F9585	O	O	O	O
CONSTELLATION	61081	PA954092	F9635	O	O	O	O
FRONTIER EXPLORER	62169	PA954450	F9655	O	O	O	O
HESSAFJORD	41224	PA953385	F9580	O	O	O	O
JUPITER	62472	PA954165		O		O	
MEGHAN HOPE	61372	AK944119	F1369	O	O		
NORTHERN AURORA	29998	PA951613	F9526	O	O	O	O
NORTHERN EMPIRE	61573	AK944587	F9666	O	O		
PACIFIC MONARCH	54645	PA952785					O
PACIFIC TRAWLER	48191	AK933349	F9601	O	O	O	
PENGWIN	29089	AK941301	F9500		O	O	O
PROSPERITY	41864	PA953361	F9593	O	O	O	O
REBECCA IRENE	51873	PA951610	F1386	O	O	O	O
RESOLUTE	59459	PA953702	F1265	O	O	O	O
SEAFISHER	56964	PA953835	F9629	O	O	O	O
TITAN	57321	PA953391	F9584	O	O	O	O
WESTWARD WIND	32660	PA953274	F1558	O	O		

UPP-Unknown Processing Plants	ADF&G Vessel	Federal Permit	ADF&G Processor	Inshore/Offshore			
Processor Name	Number	Number	ID	1991	1992	1993	1994
UNKNOWN			F0000	I	I	I	
UNKNOWN			F0052				I
UNKNOWN			F0121	I			I
UNKNOWN			F0126	I	I	I	
UNKNOWN			F0181	I			I
UNKNOWN			F0283				I
UNKNOWN			F0291	I			
UNKNOWN			F0557		I		
UNKNOWN			F0582	I	I		
UNKNOWN			F0800		I		
UNKNOWN			F0830	I			
UNKNOWN			F0932	I			
UNKNOWN			F0989	I			
UNKNOWN			F1084			I	
UNKNOWN			F1086	I	I	I	I
UNKNOWN			F1104			I	I
UNKNOWN			F1141	I			
UNKNOWN			F1255	I	I	I	
UNKNOWN			F1273	I			
UNKNOWN			F1425		I	I	I
UNKNOWN			F1489			I	
UNKNOWN			F1589				I
UNKNOWN			F1663				I
UNKNOWN			F1678				I
UNKNOWN			F1759	I			I
UNKNOWN			F1812				I
UNKNOWN			F1840				I
UNKNOWN			F4271				I
UNKNOWN			F9508	O			
UNKNOWN			F9657		I		
UNKNOWN			F9999	I	I	I	I

Appendix V

An Econometric Examination of the Relationship Between the Exvessel Price for Walleye Pollock and the Surimi Export Price to Japan

March 25, 1995

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This paper was prepared at the request of the North Pacific Fishery Management Council and may not be quoted elsewhere.

EXECUTIVE SUMMARY

An econometric international supply and demand model for Walleye Pollock, constructed by researchers at the University of Alaska Fairbanks, indicates that there was a shift in the Japanese demand for imports of surimi starting in the third quarter of 1991. This shift was a structural break from the historical price-quantity relationship for imported surimi from United States. Starting in the third quarter of 1991, the Japanese were willing to pay a higher price for the same level of surimi imports than they were prior to this date. This relationship was especially strong during the period through the end of 1992. However, the corresponding exvessel price increase did not follow this same pattern. Given the historical relationship that existed between the exvessel price for Walleye pollock and U.S. exports of surimi to Japan, the model predicted that the exvessel price would, on average, have been expected to increase by 4.6 cents per pound more than it had during this period given the price level of imported surimi into Japan. We have not speculated as to the reason for this structural break between the exvessel price of Walleye pollock and the export price of surimi. There is some indication that this price difference may have started to dissipate starting in 1993 but more data is needed to test this hypothesis.

INTRODUCTION

This paper examines the relationship between the exvessel price received for Walleye pollock caught in waters off Alaska and the U.S. export price of surimi to Japan. It uses an international econometric model developed by fisheries economists located in the University of Alaska Fairbanks Fisheries Economics Center (see Herrmann et al. 1995 and Feller 1995) to test whether there have been periods of "structural breaks" in the relationship between the exvessel price for Walleye pollock and the U.S. export price of surimi to Japan. This paper examines any possible changes in this relationship but does not attempt to examine why any changes in this structure may have occurred.

The fisheries of the North Pacific Ocean and the Bering Sea are among the most productive in the world. Over 28 percent of the 1991 world total landings of fish, mollusks, and crustaceans were harvested from the North Pacific (FAO 1993). Walleye pollock (*Theragra chalcogramma*, also known as "Alaska pollock"), whose landings exceeded 4.8 million metric tons (t) in 1991, accounted for approximately 5 percent of the combined world landings of fish, shellfish, and crustaceans. Pollock flesh is used principally as an input in the production of surimi. Surimi is the main ingredient in a number of Japanese foods, including chikuwa, fish ham, and fish sausage and it is also processed into kamaboko, a category of products that includes analog shellfish products, such as analog crab, lobster, and shrimp.

Walleye pollock is harvested in directed fisheries and as bycatch. The directed fishery includes the "B" season which generally runs during the last half of the calendar year and focuses on pollock flesh. There is also a directed roe fishery (the "A" season) during the first quarter of the year where pollock flesh is also retained. The bycatch fishery occurs (pollock landed incidentally can be retained and sold) year-round. Most of the surimi produced in the United States is exported to Japan, where it is sold in Japan for subsequent processing into final products. Product not exported to Japan is shipped to Washington and held in cold storage until market conditions become more favorable. Japan imports very limited amounts of pollock in product forms other than surimi.

THE DATA

The exvessel price used in the model is the exvessel price for Walleye pollock caught by catcher-vessels in waters off of Alaska and the surimi export price is for the total surimi exports from the United States to Japan. The data was aggregated on a quarterly basis (quantities measured in kilograms), based on a calendar year, and is presented in Appendix A. Figure 1 depicts the ratio of exvessel price to export surimi price during the modeled period.

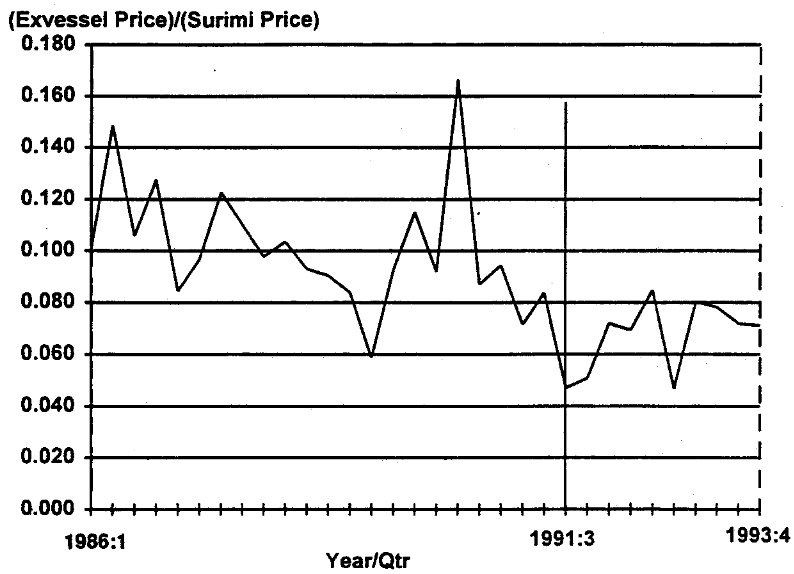

FIGURE 1 The Ratio of Quarterly Pollock Exvessel Prices to Surimi Export Prices (1986 to 1993)

The exvessel value of Walleye pollock represents that for the domestic catch and the export surimi price is for U.S. surimi exports to Japan[1]. While graphical analysis can give a visual insight into the relative movements between exvessel and wholesale prices an econometric model can add a casual relationship. In Herrmann et al 1995, an international supply and demand model

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1 In 1991, rising surimi pollock prices provided increased incentive for surimi producers to consider other types of fish for surimi. The only other U.S. caught fish that is used principally for surimi is Pacific whiting (*Merluccius productus).* 1993 Pacific whiting (hake) catches were about one-tenth as large as walleye pollock catches

was constructed to investigate the price-quantity relationships in the pollock surimi markets. The model is summarized below.

THE MODEL

Five structural equations were modeled to represent the international pollock surimi flows. The five structural equations were as follows:

1) The Japanese demand for imported U.S. surimi
2) The U.S. supply of surimi to Japan.
3) The inventory holdings of surimi in the United States
4) The inventory holdings of surimi in Japan
5) The exvessel price of Walleye pollock caught in waters off Alaska.

Directly modeled relational determinants of exvessel price were the export price of surimi, landings of Walleye pollock, interest rates, the price of fuel and electricity, and seasonal shifters. Indirectly modeled determinants of the exvessel price (from the exvessel price relationship with the exported surimi price) included the Japanese interest rates, U.S./Japanese exchange rate, inflationary indices in both the United States and Japan, beginning surimi inventories in both the United States and Japan, the price of pork and mackerel in Japan, the estimated mix of Pacific whiting in the exported surimi, the levels of surimi imports to Japan from Russia and South Korea, and population levels in Japan and the United States. In the interest of brevity, the estimated equations, except the exvessel price equation, are not reported. The exvessel price equation is show below. Most of the explanation for this equation is omitted.

Walleye Pollock Exvessel Price (1986-1993).
Dependent Variable EXV

Variable Name	**Estimated Coefficient**	**t-Ratio (22 d.f.)**
UPS	0.028101	2.80
UPS_{-1}	0.075879	5.86
ULAND	-0.30212×10^{-7}	-1.09
$ULAND_{-1}$	-0.47023×10^{-7}	-1.71
UOCE	-0.0058388	-3.61
CPIFE	0.0012105	1.19
CLOS	0.10201	5.12
Q1	-0.016708	-0.16
Q2	-0.007192	-0.07
Q3	-0.012257	-0.12
Q4	-0.02599	-0.13
SB	-0.10161	-4.59

$R^2 = 0.85$

where

EXV = Exvessel price received by the shore-based fleet for Walleye Pollock caught in the Bering Sea ($/kg). Source 4
UPS = The export price of U.S. surimi to Japan ($/kg.). Source 1, 8
ULAND = the U.S. landings of walleye pollock by both the shore-based fleet and catcher-processors (kg.). Source 4
UOCE = The expected opportunity cost of holding U.S. surimi inventory Source. 3, 8, 5
CPIFE = the U.S. consumer price index for fuel and electricity. Source 5
CLOS = "closure" an indicator variable equaling 1 in the second quarter of 1990 and 0 elsewhere.
SB = a "structural break" indicator variable that is equal to 1 beginning in the third quarter of 1991 and is 0 elsewhere.

The equation shows that a structural break between the historical relationship between the exvessel price for Walleye pollock and the surimi export price occurred starting in the third quarter of 1991 and extending to the end of 1993. The parameter of -0.10161 on the variable "structural break" (SB) indicates that during this period the exvessel price was 10.2 cents per kilogram (4.6 cents per pound) lower than the model would have predicted given the historical relationship between exvessel price and the independent variables (that occurred between 1986

Appendix VI

Revised Draft Report

Economic Impacts of the Pollock Community Development Quota Program

Prepared by
Alaska Department of Community and Regional Affairs
with assistance from:

Alaska Department of Fish and Game
Alaska Department of Commerce and Economic Development

April 1995

Acknowledgments:

The compilation and writing of this report was done by the Department of Community and Regional Affairs (DCRA), CDQ Manager, Julie Anderson, with the assistance of Karen Lang, a graduate student of Public Administration at the University of Alaska Anchorage.

The State of Alaska would like to thank Gunnar Knapp and Lee Huskey of the Institute for Social and Economic Research (ISER) for their assistance in designing this report. ISER also provided the 1990 U.S. Census data and the information for chapter five, economic impacts of the CDQ program, and the definition of economic development located in chapter six.

Information on the CDQ projects and their economic impacts is based primarily on material provided by the six CDQ groups. All of the groups were helpful in providing information for this report.

The editorial review and input by the staff of the Alaska Department of Fish and Game and the Department of Commerce and Economic Development contributed greatly as well.

A report prepared for the State of Alaska, "Economic Impacts of the 1992/93 Pollock Community Development Quotas" in June of 1994, by E3 Consulting, was the basis for much of the geographical and historical data.

Table of Contents

Executive Summary

This report examines the economic development impacts of the first twenty-five months of the Bering Sea pollock Community Development Quota (CDQ) program on the western Alaska region.

The CDQ program was designed by the North Pacific Fishery Management Council (Council) to allow residents of the economically depressed region of western Alaska access to the Bering Sea fisheries. The Bering Sea pollock fishery is one of the largest fisheries in the world with an annual harvest of approximately 2.9 billion pounds with an annual ex-vessel value in excess of $200 million. Because this is an extremely capital intensive fishery, the ability of western Alaskans to participate in the harvest of the resource at their doorstep has been severely limited.

Prior to implementation of the CDQ program, approximately 94% of the value of this fishery was accrued by non-Alaskans, virtually none of the value was captured by western Alaskans. By setting aside the 7.5% of the quota for harvest by those regions bordering the Bering Sea, the CDQ program has permitted participation of the utilization of this resource as a mechanism to spur economic development in this economically depressed region.

The economic development impacts of the CDQ program must be assessed in the context of life in western Alaska. There are 56 communities that meet the criteria for participation in the CDQ Program, representing a total population of 21,037. According to 1990 Census data, 77% are Alaska Natives. Poverty and unemployment are chronic, in 1990, more than 25% of the people in CDQ communities lived below the poverty level; twice the state rate. Unemployment rates ranged as high as 31%. In many of the CDQ communities, the average income is nearly half the median state level. Non-economic standards also portray the region's underdevelopment. Much of the housing available is substandard and utilities that most U.S. citizens take for granted such as water, sewer, and telephones are in short supply. In over half of the communities, five gallon buckets or outhouses remain the primary means of sewage disposal. Three quarters of the communities do not have piped water and sewer available to at least half the homes in the community. The result of these characteristics is poor health conditions, high rates of infectious diseases, and low living standards. It is this profound state of underdevelopment against which this report examines the economic development impacts of the CDQ program.

The best data available for describing the population and economy of western Alaska prior to implementation of the CDQ program including income, employment and other demographic information is contained in the 1990 US Census Report. For purposes of this report, those figures are used as a basis for comparison with quarterly and annual audited reports to the State in helping to assess the economic impact of the CDQ program from the date of its implementation on November 18, 1992, through December 31, 1994. Comparison of this data demonstrates important impacts on employment, income, infrastructure development, investment, training and educational opportunities in the region.

By the simple measure of jobs and income, the CDQ program is contributing to the economic development of the region, providing private sector employment opportunities where few existed.

- In the first two years, the CDQ program's contribution to local jobs *doubled*
- Jobs created by the CDQ program represent 57% of all non-government related, "basic employment" job in the region
- During this time, CDQ wages and benefits represented a 2.4% increase in income for the region

A major goal of many of the CDQ groups was to develop infrastructure within the regional fisheries that would make possible greater participation in the fishery. Each of the infrastructure developments provide benefits to the region as a whole as well as the entire fishing industry. Major infrastructure projects which have been complete or are underway include:

- Dock facilities in Atka, Nelson Lagoon, False Pass and Nome
- Harbor improvements in St. George and St. Paul
- Ice delivery systems in Savoonga and Koyuk
- Gear storage facility in False Pass
- Processing facility improvements in Shaktoolik, Unalakleet, Nome, Atka, Bethel and Emmonak

Equally important as physical infrastructure is the development of human resource infrastructure which provides the skills and expertise necessary for the long-term sustainability of economic development in the region. Progress toward that end includes:

A total of 1141 training, internship and educational opportunities were made available by the CDQ program including 176 higher education scholarships, 38 vocational education programs and 927 technician training programs.

Another major goal of the CDQ program was to provide for increased participation by western Alaska residents in the fisheries of the Bering Sea. In the first two years of the program, five of the six CDQ groups have participated in fishery investments including:

- Joint venture investments in a factory trawler, a factory longliner/crabber, two shore-based facilities and one catcher vessel.
- Wholly-owned investments in one shore-based facility and approximately thirteen small catcher vessels.
- Three CDQ groups and their harvesting partners have invested considerable resources in the development of new salmon products and markets.

Because economic development is a complex process, it is difficult to measure. Generally, economic development must add jobs and income to the region, provide for local control and human resource development and generate benefits that are sustainable over the long term.

In sum, by all of these measures, the CDQ program is contributing towards the process of economic development within the western Alaska region. It is bringing about economic development a measured by jobs, local control and long term sustainability. This infusion of capital has not only created private sector jobs in the region where few existed, it has provided hope and opportunity which are integral components to building self-esteem and self-reliance in the region.

Despite these remarkable advances, the economic activity generated to date has not transformed the region economically -- nor is there any reason to expect that it should have in just two years. The CDQ program will require continued sustenance to survive its infancy

I. INTRODUCTION

The Bering Sea pollock fishery is one of the largest fisheries in the world, with an annual harvest of about 2.9 billion pounds (1.3 million metric tons). Beginning in 1992, the Community Development Quota (CDQ) program set aside 7.5% of the Bering Sea pollock harvest (about 215 million pounds annually) for direct allocation to disadvantaged coastal communities in Western Alaska.

The 56 communities bordering the Bering Sea that received the quotas are in one of the most economically depressed regions of the United States. A major goal of the program is to allow these communities to accumulate sufficient capital so they can invest in the fishery, thus bringing sustainable economic development to the region.

This report examines the economic impacts of the first twenty five months of the Bering Sea pollock Community Development Quota (CDQ) program on the western Alaska region. The CDQ program regulations became effective on November 18, 1992 and CDQ fishing was permitted to begin on December 5, 1992. Therefore, most of the impacts of the first three years of the program actually occurred over a twenty-five month period.

Organization of this Report

Chapter II of the report describes the western Alaska region. Chapter III describes the history and implementation of the CDQ program, and provides an overview of the program during the first twenty-five months. Chapter IV describes the types of projects proposed by the CDQ organizations and the activities undertaken during this period. Chapter V describes the broader development impacts of the program, including impacts on future employment and income. Finally, Chapter VI addresses the other impacts of the CDQ program on the region and the potential effects if the program were discontinued.

Information Sources

The economic description of the western Alaska region in this report is based primarily on the 1990 U.S. Census. Information on the CDQ projects and their economic impacts is based primarily on material provided by the six CDQ groups. These include CDQ applications, quarterly reports and audited annual reports.

II. THE WESTERN ALASKA REGION

The Physical Setting

The Bering Sea is renowned for its marine productivity and fierce weather. The open ocean waters of the Bering Sea are home to some of the greatest fishery resources on earth. They contain vast schools of fish such as pollock and herring. The bottom is home to numerous commercially caught species of fish and crustaceans including Pacific cod and the famous, and large, king crab. The rivers emptying into the Bering Sea are visited yearly by millions of salmon migrating upstream to spawn. Feeding on all of this natural bounty are numerous species of marine mammals and sea birds.

The open waters of the Bering Sea annually freeze as far south as the Pribilof Islands and Bristol Bay, and even further south along the coast. Natural deep draft harbors are non-existent north of the Alaska Peninsula due to extreme tides, low terrain and silty bottom. The weather has been described as among the worst on earth, with hurricane force winds, mountainous waves, freezing spray, and a winter season of short days and long nights.

The Alaskan coast which borders the Bering Sea is barren and entirely treeless. It includes several thousand miles of coast from the uninhabited tip of the Aleutian Islands to the tiny community of Wales astride the Bering Straits. The landmass varies from volcanic along the Aleutian Islands to marshy delta at the mouth of the Yukon and Kuskokwim Rivers. Where the ground is not solid rock, it is often underlain by permanently frozen ground tens or even hundreds of feet deep.

Natural Resources

There are limited mineral resources along the coast including deposits of gold, platinum, and tin. Due to the high expense of operating in the harsh environment, very little actual mining occurs. There is also the possibility of major petroleum reserves offshore from the region. Due to the engineering challenges, changing regulations, and high exploration and production costs these reserves have not been developed, although some exploration wells have been drilled.

The Bering Sea arc is barren in winter but lush in summer. At that time it possibly contains more mass of mosquitoes than all other species combined. Vast flocks of waterfowl migrate north to nest in the marshes and along the rivers and lakes. Seabirds nest in the millions in densely packed rookeries. Animals that have hibernated for much of the year take advantage of the few summer months to eat a years worth of food. Large animals such as caribou and whales migrate back and forth to the rich, productive summer grazing grounds. Also during the brief summer, millions of salmon return to their natal streams and herring to the coastline. These are followed by the numerous fish, mammals and birds that feed on them.

The Western Alaska Economy

There are four main regional centers of commerce and population in the region: Dutch Harbor, King Salmon, Dillingham, and Nome. (Dutch Harbor is not one of the CDQ communities due to its pre-existing involvement in the Bering Sea fisheries.) Much of the economy in King Salmon and Dillingham is based on seasonal salmon fishing, whereas Nome was originally based on gold mining. All three function as commercial and transportation hubs. Residents from outlying communities visit to purchase goods and services not available locally and pass through on their way to Anchorage and beyond.

While several roads exist in the region, they link only a few of the communities. None of the roads that exist are connected to any outside of the region. Almost all of the towns and villages are totally isolated from each other. Access between them is limited to boats in the summer, snowmachines in the winter, and planes. The closest CDQ community to a continuous road system is about 300 air miles from Anchorage and the farthest over 1,200 miles.

The reliance on air transportation means that the price of many goods is greatly increased over other areas of the country. In addition, it is very expensive to travel to Anchorage or even between communities. Wages are commensurate with these higher costs and therefore costs of production with local labor are higher than elsewhere.

The remoteness and isolation of the western Alaska region limits employment opportunities for most residents to those which can be found within their communities. Commuting out of the region or even from smaller communities to regional centers on a regular basis is prohibitively expensive.

The wage economy of western Alaska is concentrated in only a few sectors. Relatively few locally consumed goods and services are provided in the region; most goods and services are imported. There is a high dependence on income from transfer programs such as the Alaska Permanent Fund Dividend Program and the Alaska Longevity Bonus Program, and Aid for Families with Dependent Children.

The majority of regional employment is with federal, state and local governments. Federal employees consist primarily of those managing federal lands, providing health care, airport operations, and military personnel. State personnel are employed primarily in schools, various state agencies, health care centers, and airport operations. Local governments employ administrators, school workers, utility operators and local public safety officers.

A typical small community has limited employment opportunities. These might include a school, post office, local utilities, retail store(s), local government, health aide, public safety officer, airport agent, National Guard, and local road and airport maintenance. Others employed locally such as school teachers and clerics are most often from outside the region. Larger communities have more services, retail centers, and government services and therefore more employment opportunities.

Jobs related to education account for 26% of all regional employment. Each community has its own school and often it is the main employer in the community. Many times this is accomplished by sharing one full time position between several households to ensure the maximum employment opportunities.

U.S. Census Data for the Western Alaska Region

The best available data for describing the population and economy of western Alaska are from the 1990 U.S. Census, which occurred prior to the start of the CDQ program in 1992. As will be discussed in Chapter V, the CDQ program has provided significant new employment and income in some CDQ communities. In addition, economic changes not related to the CDQ program have occurred in the fishing industry as well as other parts of the economy. The 1990 census data are therefore somewhat out-of-date. However, they still provide a reasonable picture of general economic conditions in the region. No other detailed up-to-date data exist on the economy and population of western Alaska in 1995.

Population

There are 56 communities in the CDQ region of western Alaska. As shown in Table II-1, these communities had a total population of 21,037 in 1990. The combined populations of the villages represented by individual CDQ groups ranged from as low as 397 for the Aleutian Pribilof Island Community Development Association to as high as 7621 for the Norton Sound Economic Development Corporation.

Seventy-seven percent of the residents of the CDQ area were Alaska Natives. All of the groups have a majority Alaska Native population. For three of the groups (APICDA, CVFC, and YDFDA) the Alaska Native population was over ninety percent of the total.

All of the CDQ groups have a relatively large share of their population under the age of sixteen; in the YDFDA more than 40% of the population is under sixteen. This indicates both a growing labor force which will require jobs in the future and the relatively larger magnitude of any employment increase relative to the working age population.

Labor Force and Employment

Table II-2 shows labor force and employment characteristics of the CDQ group villages. The civilian labor force is only 59% of the population aged 16-65. Civilian labor force participation is limited by membership in the military and choice not to participate in the labor force.

The unemployment rate is defined as the number of persons working divided by the civilian labor force. At the time of the census all CDQ groups were experiencing relatively high levels of unemployment, ranging from 9% (BBEDC) to 31% (YDFDA). While these high unemployment rates partly reflect the seasonality of employment opportunities and the timing of the census in April, they also may show the effects of limited employment opportunities. Unemployment rates may significantly underestimate true unemployment if workers drop out of the labor force due to lack of employment opportunities: When people know there are no jobs available, they stop looking and are not counted as unemployed.

Table II-2 also shows the types of jobs held by the residents of the CDQ areas in 1989. What is most interesting about this table is the relatively low share of the resident population working in the industries and occupations associated with fishing. While almost fifteen percent of the employment in the Aleutian Pribilof and Central Bering Sea regions was in the fisheries industry, no other region had over five percent in this industry. Only the Central Bering Sea had a significant share of employment in manufacturing, which is almost entirely fish processing. While work in the transportation industry may also be fisheries-related, fishing industry employment was not significant in most of the CDQ group areas in 1990. In five of the groups Educational Services and Public Administration were the most important industries, indicating the importance of public sector/government jobs to these regions.

Income

Table II-3 describes the income characteristics of the CDQ group communities in 1989. All of these regions had median incomes which were lower than the state median income of $41,408 in 1989. The median income in the Central Bering Sea area and the Bristol Bay area was less than ten percent below the state level, but in the Yukon Delta area and the Aleutian Pribilof area the median income was only slightly greater than half the state level. The relatively high cost of living in rural Alaska suggests that in real terms, comparing the median incomes may actually underestimate the economic well being of residents in these regions.

In 1989 the poverty rate for the state was almost seven percent. The poverty rates in all the CDQ areas except the Central Bering Sea area were at least twice the state rate.

Social Conditions

In 1990, more than 25% of the people in the 56 CDQ communities lived below the poverty level. Most residents of western Alaska are Alaska Natives. Many older people speak English as a second language or not at all. Much of the housing available in the communities is substandard and utilities that most U.S. citizens take for granted such as water and phones are in short supply. In over half of the communities, five gallon buckets or outhouses remain the primary means of sewage disposal. In 1990, only thirteen communities (24%) had piped water and sewer available to at least half of the homes. The result is poor health conditions, high rates of infectious diseases, and low living standards.

Characteristics of the 56 CDQ Communities in 1989	
Total population	21,429
Average community population	390
Native Americans as % of the population	78%
Houses with no plumbing	37%
Houses with no phone	29%
Persons below poverty level	25%
	Source: 1990 U.S. Census

Western Alaskan communities in general have many of the social ills associated with poverty and isolation. Many of these communities experience considerable problems with drug and alcohol abuse. Young people suffer from high rates of teen pregnancy and suicide. Prevalent throughout many communities is a feeling of despair and hopelessness.

Subsistence

Western Alaska residents derive a large part of their food from subsistence hunting, fishing, and gathering. Based on a subsample from the CDQ communities, the average subsistence harvest is 437 pounds per person. The majority of this harvest is fish. Per-capita subsistence harvests tend to be largest for residents of smaller communities which have fewer employment opportunities, very limited access to retail stores, and the highest percentage of Native inhabitants.

Subsistence harvests provide a large portion of the nutritional needs of western Alaska residents. At least as important is the cultural and emotional satisfaction that subsistence activities provide. It is not uncommon for western Alaskans to value subsistence harvest participation as a priority over wage labor. The result is often confusing to persons who do not understand this trade-off, as employees may take time off from wage employment to hunt and fish with their families whether or not such time is provided.

Salmon and Herring Fisheries

Salmon and herring fishing occurs in many parts of western Alaska. However, with the notable exception of the Bristol Bay salmon fishery, most local fisheries have a very low average catch and provide relatively low income to fishermen. Local participation in the larger regional fisheries has decreased over time and the necessity of a limited entry fishing permit--prohibitively expense in the more lucrative fisheries--has discouraged further entry. Over the past two decades about 25% of the most valuable salmon fishing permits have migrated out of the region.

In 1992 about 20% of the regional population owned fishing permits or were licensed crewmen while just over 2% of the people were employed in fish processing. Most fishermen and the vast majority of processors working in the region reside outside western Alaska. Many local fishermen have other jobs, often only part-time. Since most local residents have few assets, they lack the means of acquiring salmon fishing permits. Many locals rely on subsistence hunting and gathering They must choose between a short intense working season, often at relatively low wages, or harvesting salmon for winter food.

Some western Alaska salmon fisheries have declined in recent years and some have not opened. In 1993 even subsistence salmon fishing was closed in some areas.

Table II-1: Selected 1990 U.S. Census Data for CDQ Communities: Population

	Aleutian Pribilof Island Community Development Association	Bristol Bay Economic Development Corporation	Central Bering Sea Fishermen's Association	Coastal Villages Fishing Cooperative	Norton Sound Economic Development Corporation	Yukon Delta Fisheries Development Association	Total, All CDQ Groups
Total Population	397	4719	763	5781	7621	1756	21037
Male	201	2525	489	3051	4104	879	11249
Female	196	2194	274	2730	3517	877	9788
Native	364	2641	531	5521	5617	1603	16277
Under 16 years	120	1463	176	2256	2659	704	7378
Ages 16-64	243	3061	562	3203	4568	971	12608
65 years and over	34	195	25	322	394	81	1051
Percentage of Population							
Male	51%	54%	64%	53%	54%	50%	53%
Female	49%	46%	36%	47%	46%	50%	47%
Native	92%	56%	70%	96%	74%	91%	77%
Under 16 years	30%	31%	23%	39%	35%	40%	35%
Ages 16-64	61%	65%	74%	55%	60%	55%	60%
65 years and over	9%	4%	3%	6%	5%	5%	5%

Source: 1990 U.S. Census. Data provided by Institute of Social and Economic Research.

Table II-2: Selected 1990 U.S. Census Data for CDQ Communities: Employment

	Aleutian Pribilof Island Community Development Association	Bristol Bay Economic Development Corporation	Central Bering Sea Fishermen's Association	Coastal Villages Fishing Cooperative	Norton Sound Economic Development Corporation	Yukon Delta Fisheries Development Association	Total, All CDQ Groups
Civilian labor force	133	1786	370	1612	3048	549	7498
As % of population 16-64	55%	58%	66%	50%	67%	57%	59%
Number of people employed	117	1620	330	1296	2540	378	6281
Number of people unemployed	16	166	40	316	508	171	1217
Unemployment rate	12%	9%	11%	20%	17%	31%	16%
Employment by Occupation							
Executive, Administrative, and managerial occupations	9%	16%	9%	8%	14%	10%	12%
Professional specialty occupations	10%	21%	11%	25%	20%	24%	20%
Technicians and related support occupations	0%	5%	4%	1%	5%	3%	4%
Sales Occupations	8%	6%	1%	8%	7%	10%	7%
Administrative support occupations including clerical	7%	16%	12%	16%	18%	19%	16%
Private household occupations	0%	0%	0%	1%	0%	0%	0%
Protective service occupations	2%	2%	6%	3%	2%	3%	2%
Service occupations, except protective and household	22%	11%	10%	18%	16%	16%	14%
Farming, forestry, and fishing occupations	13%	2%	10%	1%	1%	0%	1%
Precision production, craft, and repair occupations	7%	11%	17%	8%	9%	7%	9%
Machine operators, assemblers and inspectors	3%	1%	6%	2%	3%	1%	2%
Transportation and material moving occupations	14%	4%	5%	2%	1%	1%	2%
Handlers, equipment cleaners, helpers, and laborers	7%	4%	11%	7%	5%	5%	5%
Employment by Industry							
Agriculture, forestry and fisheries	15%	3%	13%	1%	1%	1%	2%
Mining	0%	0%	0%	0%	4%	0%	2%
Construction	14%	4%	10%	2%	3%	2%	3%
Manufacturing, nondurable goods	0%	2%	22%	2%	1%	0%	2%
Manufacturing, durable goods	0%	1%	0%	0%	0%	0%	0%
Transportation	10%	11%	4%	5%	8%	7%	8%
Communications and other							0%
public utilities	2%	5%	5%	5%	3%	6%	4%
Wholesale trade	0%	1%	2%	2%	0%	3%	1%
Retail trade	15%	12%	4%	15%	16%	18%	14%
Finance, insurance and real estate	0%	2%	0%	0%	3%	1%	2%
Business and repair service	2%	3%	1%	2%	2%	1%	2%
Personal services	0%	2%	4%	2%	2%	1%	2%
Entertainment and recreation servi	0%	0%	1%	0%	2%	1%	1%
Heath services	7%	10%	6%	4%	9%	5%	8%
Educational services	16%	22%	10%	41%	22%	38%	25%
Other professional and	0%	0%	0%	0%	0%	0%	0%
related services	7%	6%	8%	4%	7%	3%	5%
Public administration	13%	16%	12%	15%	16%	14%	15%

Source: 1990 U.S. Census. Data provided by Institute of Social and Economic Research.

Table II-3: Selected 1990 U.S. Census Data for CDQ Communities: Income

	Aleutian Pribilof Island Community Development Association	Bristol Bay Economic Development Corporation	Central Bering Sea Fishermen's Association	Coastal Villages Fishing Cooperative	Norton Sound Economic Development Corporation	Yukon Delta Fisheries Development Association	Total, All CDQ Groups
Total income	$4,583,225	$77,039,021	$11,532,745	$30,048,288	$84,455,823	$12,049,776	$219,708,878
Per capita income	$11,545	$16,325	$15,115	$5,198	$11,082	$6,862	$10,444
Total household income	$4,526,806	$72,849,438	$7,926,874	$29,831,135	$84,064,434	$11,868,549	$211,067,236
Number of households	135	1480	161	1361	2238	411	5786
Average income per household	$33,532	$49,223	$49,235	$21,919	$37,562	$28,877	$36,479
Household income distribution							
Less than $5,000	5.9%	6.4%	5.6%	15.1%	9.6%	5.1%	9.6%
$5,000 to $9,999	13.3%	7.8%	0.0%	16.7%	7.7%	12.2%	10.1%
$10,000 to $14,999	17.8%	8.2%	5.0%	14.1%	10.5%	14.6%	11.1%
$15,000 to $24,999	14.1%	11.9%	14.3%	21.0%	14.1%	25.3%	16.0%
$25,000 to $34,999	8.1%	11.8%	7.5%	15.0%	13.2%	12.9%	13.0%
$35,000 to $49,999	14.8%	15.3%	26.7%	9.8%	16.0%	14.8%	14.6%
$50,000 to $74,999	16.3%	20.1%	23.0%	6.0%	15.8%	10.2%	14.4%
$75,000 to $99,999	5.2%	10.6%	11.8%	1.5%	8.7%	1.7%	7.0%
$100,000 to $149,000	4.4%	6.5%	5.0%	0.7%	4.3%	3.2%	4.0%
$150,000 or more	0.0%	1.4%	1.2%	0.0%	0.0%	0.0%	0.4%
Median household income (dollars)	$23,750	$38,437	$39,922	$16,691	$31,145	$21,193	
Poverty Status in 1989							
Number of families	99	1063	132	1091	1641	327	4353
Families in poverty	14	148	5	418	305	79	969
Percent of families in poverty	14.1%	13.9%	3.8%	38.3%	18.6%	24.2%	22.3%

Source: 1990 U.S. Census. Data provided by Institute of Social and Economic Research.

III. THE COMMUNITY DEVELOPMENT QUOTA PROGRAM

People have harvested the resources of the Bering Sea since it was formed, sometime after the last ice age and after immigration to the Americas had begun. Until recently, this harvest occurred almost exclusively along the shores and on rivers. Native people ventured only a short distance from shore to fish and hunt marine mammals. During the late 1800s whalers plied the waters and some fishing vessels began making annual trips north shortly thereafter. It was not until the middle of this century that large boats, all foreign, began fishing far offshore.

With the passage of the Magnuson Act in 1976 the groundwork was laid for domestic participation in the fisheries. The Act prioritized access to the resource. Fully domestic harvesting and processing operations were given first priority, followed by joint ventures (American vessels fishing for foreign floating processors), and finally foreign vessels. It took a decade for the domestic fleet to develop to the point that it could play a significant part in the fishery.

Until the late 1970s, little of the harvest from the Bering Sea itself was by Americans. Instead, foreign fleets from Europe and Asia harvested the fish and processed it aboard large floating processors. In 1979, only 615 metric tons or .05% of the 1.2 million mt Bering Sea harvest was domestically caught and processed. By 1988, all of the harvest (2.0 million mt) was by domestic vessels and 34% of the processing was conducted domestically. Finally, beginning in 1991, all of the harvest from U.S. waters of the Bering Sea was also processed domestically. However, most of the fleet is from ports thousands of miles to the south.

The swift transition from foreign to domestic fisheries resulted in an overcapitalized fleet. By the early 1990's, fishing seasons that had previously lasted all year were measured in weeks or days. Vessels traveled north to the fishing grounds fully crewed and processing workers were typically imported from areas outside Alaska where wage rates are lower. The result was that most of the people living in the western Alaska communities on the shores of the Bering Sea had no viable means of participating in these fisheries.

CDQ Program Development

The concept of CDQ's for western Alaskan communities began to be discussed in the mid-1980s. An unsuccessful attempt was made to inject a generic CDQ concept into federal fishery regulations in 1989. Prior to that, beginning in 1988, the North Pacific Fishery Management Council, established by Congress to develop management plans, considered CDQ's for sablefish longline fisheries. As part of that plan, an idea of allocating part of the total allowable catch directly to communities was developed. This would allow the community members access to the resource at their doorstep. It would also remove them from any race for fish and allow them to participate in the fishery at their own pace.

By 1989, it was apparent that there were too many vessels harvesting pollock. Therefore, responding to a need to better manage the fishery, the Council began investigations into allocating pollock harvests between vessels delivering to shorebased processors and those processing at-sea.

Finally, the Council decided that CDQ's could be a viable means of spurring economic development in nearby economically depressed coastal communities without greatly impacting the existing fishing industry. Pollock CDQ's were added to the pollock allocation process. Large shorebased and offshore trawl vessels, capable of fishing far from land, are needed to harvest pollock. None of the people along the Bering Sea coast owned such vessels and only a few communities had port facilities sufficient to handle them. Taken together with the generally poor economic conditions found throughout the region, the likelihood of local residents being able to participate in the pollock fishery without assistance seemed negligible. The opportunity to provide a diversified and stabilizing source of income to local residents and communities was appealing to many, including the State of Alaska. The debates and decisions necessary to reach a viable pollock allocation were intense. The CDQ program became an integral component of a compromise management strategy.

The Secretary of Commerce approved the pollock allocations in early 1992 but the final regulations implementing CDQ's were not published until late that year. The allocation to CDQ groups was set at 7.5% of the overall pollock total allowable catch for the Bering Sea and Aleutian Islands management areas. This would allow the groups the privilege of harvesting a specific tonnage of fish annually, at any time of their choosing.

The allocations were for two years, 1992 and 1993, with reallocations made for the 1994 and 1995 seasons. The regulations became effective on November 18, 1992 and were published in final form on November 23, 1992, at 50 CFR part 675. Corresponding State of Alaska emergency regulations were also published in late 1992.

One of the valuable attributes of CDQ's is the ability to fish for pollock when the open fisheries are closed allowing fishing to occur at virtually anytime during the year. Vessels used to harvest the CDQ allocations may continue to operate when they otherwise would be unable to earn income from the pollock fishery. It also allows the Alaska fishing industry the ability to provide pollock to the marketplace throughout the year which has a positive affect on marketshare especially in the domestic marketplace.

Implementation of the CDQ Program

The Secretary of Commerce delegated much of the implementation of the CDQ program to the Governor of Alaska using a frameworked application and review process. The State was charged with full review of CDQ proposals and making allocation recommendations to the

Secretary. The Secretary retained overall allocation decision authority, including the authority to modify an allocation at any time.

As part of the Community Development Quota program application process the Governor's designees as identified in AS §6 AAC 93.915 establish a schedule for the receipt of the applications, initial application evaluation, public hearings and final application review. Within a reasonable time before the beginning of the application period, the designees also publish a notice of the CDP application schedule in at least one newspaper of general circulation in Western Alaska and one newspaper of general circulation in the state. The state also mails a copy of the notice to eligible communities. The application period will be a minimum of 14 days except as provided for in AS §6 AAC 93.075 which states the governor can, at his discretion, relax or reduce the notice requirements if the governor determines that a shortened or less expensive method of public notice is reasonably designed to reach all interested persons.

The CDQ application is required to contain a description of the goals and objectives of the Community Development Plan (CDP), the allocation requested, the length of time necessary to achieve these goals as well as the number of individuals expected to be employed and a description of vocational and educational training programs the CDP will generate. The CDP should also include a description of the existing fishery related infrastructure and how the CDP would use or enhance existing harvesting or processing capabilities, support facilities and human resources. The CDP is also required to include a description of how new capital or equity will be generated for the applicants fishing or processing operations; a plan and schedule for transition from reliance on the CDQ to self-sufficiency in fisheries; and a description of the short and long-term benefits to the applicant from the allocation.

Upon receipt of the CDP applications the governor's designees perform an initial evaluation of the CDP to determine if it is complete and has the necessary information required under §6AAC 93.025. The designees, staff members of the Departments of Community and Regional Affairs, Fish and Game, and Commerce and Economic Development, schedule a public hearing in accordance with federal regulations. The governor's designees then take into consideration the CDP application and public testimony and select those applications that they believe best satisfy the objectives, requirements, and criteria of the CDQ program and recommend those applications to the governor, who in turn evaluates and makes the final recommendation to the Secretary of Commerce for approval.

The initial application process in 1992 occurred during an extremely short time frame. The ability of the eligible villages to organize into CDQ groups, develop a Community Development Plan and form industry partnerships is a testimony to the determination the people of western Alaska to gain the greatest possible benefit from the CDQ program.

During the last half of 1992, communities and fishermen's groups along the Bering Sea coast began to organize in response to the pending CDQ regulations. In order to qualify for a

CDQ allocation, an organization and its member communities had to meet several criteria. The major criteria for community qualification consisted of:

Location within 50 nautical miles of the Bering Sea.
Native village as defined by the Alaska Native Land Claims Settlement Act
Residents conduct over 50% of their current subsistence and commercial fishing effort in the waters of the Bering Sea.
No previously developed harvesting or processing capacity sufficient to support substantial groundfish fisheries participation

A total of 56 communities were eligible and all held meetings to select fishermen representatives. As the summer drew to a close, the communities coalesced into six different applicant organizations. The groupings were self-determined and were based primarily on geographical proximity and cultural boundaries.

Community Development Quota Groups	
Aleutian Pribilof Island Community Development Association (APICDA)	5 communities
Bristol Bay Economic Development Corporation (BBEDC)	13 communities
Central Bering Sea Fishermen's Association (CBSFA)	1 community
Coastal Villages Fishing Cooperative (CVFC)	17 communities
Norton Sound Economic Development Corporation (NSEDC)	15 communities
Yukon Delta Fisheries Development Association (YDFDA)	4 communities

List of CDQ Communities by Group

APICDA	Atka, False Pass, Nelson Lagoon, Nikolski, St. George
BBEDC	Aleknagik, Clark's Point, Dillingham, Egegik, Ekuk, Manokotak, Naknek, King Salmon/Savonoski, Pilot Point/Ugashik, Port Heiden, South Naknek, Togiak, Twin Hills
CBSFA	St. Paul
CVFC	Cherfornak, Chevak, Eek, Goodnews Bay, Hooper Bay, Kipnuk, Konigianak, Kwigillingok, Mekoryuk, Newtok, Nightmute, Platinum, Quinhagak, Scammon Bay, Tooksok Bay, Tuntutuliak, Tununak
NSEDC	Brevig Mission, Diomede/Inalik, Elim, Gambell, Golovin, Koyuk, Nome, Savoonga, Shaktoolik, St. Michael, Stebbins, Teller, Unalakleet, Wales, White Mountain
YDFDA	Alakanuk, Emmonak, Kotlik, Sheldon Point

Membership of each CDQ group is composed of a representative of each member community. An appropriate governing body from each community joining a CDQ group had to elect a representative from the community to the CDQ organization's Board of Directors. Three-quarters of the members of each Board were required to be either commercial or subsistence fishermen.

In order to qualify for a pollock allotment, each CDQ group had to prepare a comprehensive Community Development Plan (CDP) application for presentation to the Governor of Alaska and the Secretary of Commerce. The application had to describe the communities and their economies and lay out the group's specific goals and objectives. The plans had to request specific amounts of pollock, and to describe specifically how the pollock proceeds would be utilized, including describing specific fishery development projects that would be pursued along with measurable milestones. Finally, the plans had to demonstrate that the CDQ group itself would be able to continue as a viable business entity after the CDQ program had ended.

Application Requirements:

- The CDQ group's goals and objectives
- Employment to be created
- Existing fishing related infrastructure
- Business plans
- Business and loan relationships
- Presentation of a budget
- Sufficient management and technical experience

Industry Partners

A large part of the 1992/93 application process for CDQ groups involved locating and contracting with an industry partner and developing programs to utilize anticipated CDQ revenues. Each CDQ group found it necessary to contract with an established seafood company to make sure that the pollock would be harvested and processed in an economically efficient manner. The concept of partnerships with industry participants was perceived as an excellent vehicle for joint venture investments. It also would facilitate an important transfer of skills and expertise in the seafood industry to the CDQ groups. It was hoped that the industry partners would contribute greatly to the entry of CDQ communities as successful participants in the Bering Sea fishing industry.

When pollock CDQs were imminent, a number of major pollock harvesters and processors investigated partnerships with potential CDQ recipients. A request for proposals process ensued in which each CDQ group chose from a variety of offers. Each industry proposal contained a different mix of payments, training, employment opportunities, and assistance with other regional fishing business ventures. Existing pollock harvesters and processors were interested in the CDQ program because it gave them an opportunity to continue to operate their vessels at a time when they might otherwise be idle.

The industry partners were chosen by the CDQ groups based on the mix of which most closely fit the development goals of that group. Each of the six groups agreed to a specific price per metric ton for the use of CDQ pollock or a base price plus some form of profit sharing.

By the time the 1994/95 application process occurred, a steep decline in pollock prices had demonstrated the volatility of the pollock market. Several of the groups switched from a fixed fee to a base price and profit sharing. This was done both to provide a higher potential price to the CDQ groups and to protect the industry partners in the event of a continued pollock market collapse.

CDQ organizations and their industry partners (1992 - 1995):

Aleutian Pribilof Community Development Association	Trident Seafoods, Inc.
Bristol Bay Economic Development Corporation	Oceantrawl, Inc.
Central Bering Sea Fishermen's Association	American Seafoods Company, Inc.
Coastal Villages Fishing Cooperative	Golden Age Fisheries
Norton Sound Economic Development Corporation	Glacier Fish Company
Yukon Delta Fisheries Development Association	Golden Alaska Seafoods, Inc.

CDQ Allocations

The pollock allocations for 1992 and 1993 were made in late 1992. Different amounts were given to each group based on the number of communities they represented, their expressed needs, and the soundness of their plans.

Approved CDQ Allocations	1992/93	1994/95
APICDA	18%	18%
BBEDC	20%	20%
CBSFA	10%	8%
CVFC	27%	27%
NSEDC	20%	20%
YDFDA	5%	7%

The 1994 and 1995 allocation process began in early 1993 and the Secretary made final allocations late in the year. As indicated in the above chart, changes were made to the 1994 and 1995 allocations.

As stated earlier, the allocation decisions are based on the CDQ organization's Community Development Plan(CDP) and their ability to implement and fulfill their goals. The allocation process is of a competitive nature with each group preparing a CDP that would provide substantial gain to their communities. This was done to ensure the greatest benefit to the residents of the region.

CDQ Groups' Goals & Objectives

Each CDQ group proposed to use its funds to create more local development opportunities. To this end, all are using funds for training and education, jobs, and infrastructure development. Because of their different geographical locations, existing economic conditions, and other local employment opportunities, each group developed a different program philosophy. The result has been a blend of investing, training, and infrastructure development all aimed at developing and improving the regional fisheries and overall economies.

All but one of the groups declared itself a non-profit corporation. The one group which formed a for-profit company entered into a partnership in a factory-trawler. Most of the groups have since formed auxiliary for-profit corporations to participate in business projects and activities. These include YDFDA's small boat fleet, APICDA's Management Company, NSEDC's Norton Sound Fish Co., and CVFC's salmon processor. More for-profit ventures such as these are being developed as more development plans are implemented.

By declaring themselves to be non-profit corporations, each group had to seek a ruling from the Internal Revenue Service as to whether or not these activities and corporate structures would qualify. The wait for the IRS ruling resulted in an important-side benefit: each group was required by the State to keep 40% of their revenues in a dedicated tax liability fund. Consequently, during the first year of the CDQ program the groups were subject to enforced savings. This allowed them to grow and refine their development plans without over-spending on initial projects. The expenditure and savings patterns of the groups for 1992/93 reflect this.

CDQ Group Primary Development Philosophies

Due to the regional idiosyncratic nature of the CDQ groups, each CDQ organization developed goals and objectives to meet the both the long and short-term needs of their communities. As reported earlier, each group has commonalties such as high unemployment, low living standards and limited economic development opportunities. How each region decides to address these issues is entirely self-determined. The list of development philosophies below is an indication of the differing objectives of each group.

APICDA -
Create income and infrastructure generating business opportunities for the CDQ group in local communities and businesses.

BBEDC -
Create an investment fund with which to invest in the seafood industry outside local, highly capitalized fisheries.

CBSFA -
Use CDQ income to leverage local infrastructure development.

CVFC -
Invest in ownership of offshore processor and use vertical integration and CDQ allocations to generate local employment.

NSEDC -
Increase participation and profitability by residents in regional fisheries and invest in the seafood industry.

YDFDA -
Train community residents as fishermen and finance vessel and gear loans and infrastructure development

CDQ Program Monitoring

The CDQ program requires both federal and state oversight. The federal and state governments have each added staff to respond to monitoring needs. Approximately the equivalent of one federal and three state full-time positions are dedicated to the CDQ administration as well as part-time assistance on policy-making decisions by staff from several agencies.

The federal monitoring agency is the National Marine Fisheries Service. Federal responsibilities include daily monitoring of catch, debriefing of fishery observers, writing regulations, and review of the overall program. As is the case in the open-access fishery, federal funds support the fishery management and allocation decision making process.

The State is responsible for the ongoing monitoring of each CDQ group's performance, ensuring compliance with CDQ plans and regulations, providing professional assistance, reviewing quarterly and annual reports, and participating in the allocation decision making process. State agencies involved in this process include the Departments of Community and Regional Affairs, Fish and Game, and Commerce and Economic Development. The State requires quarterly reports, conducts several meetings with each group annually, requires annual audit and compliance reports, and retains the right to conduct an internal audit and review of any CDQ group's accounts at any time.

CDQ Fisheries Monitoring

All at-sea processors in the open access pollock fisheries are required to carry a single authorized government observer. However, with the necessity of accurate accounting for all harvests to the pound, new methods were required. The CDQ organizations were attuned to this especially in terms of bycatch of species such as salmon and herring. These species are important to western Alaskans for both commercial and subsistence fishing. Therefore, the industry partners and CDQ groups voluntarily instituted new monitoring systems. They began using two observers on each processing vessel so that the trawls could be observed around the clock. Also, they began implementing methods to volumetrically measure all harvest. The methods determined by the North Pacific Fishery Management Council may be used as a basis for monitoring programs currently under consideration for the rest of the industry.

IV. OVERVIEW OF CDQ GROUPS AND ACTIVITIES

This chapter provides a brief overview of each CDQ group and the activities that it has undertaken to date.

Table IV-1 provides an overview of all activities of the six CDQ groups. Activities listed in bold type are actually underway. Activities listed in italics are in a development or planning stage. Activities listed in parentheses are potential projects which have been suggested by the CDQ groups in their Community Development Plans or other documents.

Table IV-1

CDQ Organizations	APICDA	BBEDC	CBSFA	CVFC	NSEDC	YDFDA
PROJECT TYPE						
Administration	x	x	x	x	x	x
Business Development						
Alaska Seafood Investment Fund		x				
Salmon & Herring Marketing					x	
(Coastal Village Investment Fund)				x		
(Cattle Ranch -revoked)	x					
(Nikolski Tourism - revoked)	x					
(Vessel Haul Out/Storage)			x			
(Seafood Waste Conversion)			x			
(Entrepreneurship Program)		x				
Employment						
Resident Employment Program	x	x	x	x	x	x
Equity Investments						
APICDA Management Co.	x					
APICDA Joint Ventures	x					
Imparpiqamiut Partnership				x		
Longline Partnership			x		x	
Norton Sound Fish Co.					x	
Yukon Delta Fisheries, Inc.						x
J/V Floating Processor						x
(Longline Vessel)						x
Fishery Development						
Salmon Restoration Program					x	
Exploratory Fishing Research			x	x		x
Product Diversification Program	x			x	x	
St. Lawrence Halibut Fishery					x	
(Fishery Development Grants)		x				

ORGANIZATION		APICDA	BBEDC	CBSFA	CVFC	NSEDC	YDFDA
IFQ/Limited Purchase							
IFQ Fund		x					
Permit Brokerage			x				
IFQ/Permit Fund						x	x
Infrastructure							
Atka Dock Facility		x					
St. George Harbor		x					
False Pass Gear Storage		x					
Nelson Lagoon Dock		x					
False Pass Dock Improvement		x					
Nome Dock						x	
Savoonga Ice Delivery System						x	
Koyuk Ice Machine						x	
St. Paul Harbor				x			
St. Paul Dock				x			
Nikolski Boat Ramp		x					
Moses Pt. Buying Station						x	
Golovin Buying Station						x	
(Infrastructure Fund)			x				
Loan Program							
Small Business		x					x
Boat & Gear		x	x	x	(x)	x	x
Processing Plant							
Atka Pride Seafoods J/V		x					
Unalakleet Fish Plant						x	
Coastal Villages Fisheries					x		
Emmonak Cooperative							x
Norton Sound Crab Co.						x	
Shaktoolik Plant						x	
Mekoryuk Plant					x		
Nelson Lagoon Plant		x					
(J/V Shoreside Plant)				x			
Scholarship							
Scholarship Program		x	x	x	x	x	x
Training							
Shoreside Training Program		x					
Vocational Training & Education		x	x	x	x	x	x
(Salmon Roe University)					x		
(Observer Training Program)			X				
Other							
Impact Fund				x			

Activities are listed in thirteen different categories. All groups are involved in some categories, including administration, training, employment and scholarship programs. In contrast, only some groups are involved in IFQ purchases, infrastructure development, fisheries development and equity investments.

The remainder of this chapter provides a more detailed description of the goals and activities of each group.

ALEUTIAN PRIBILOF ISLAND COMMUNITY DEVELOPMENT ASSOCIATION

The Aleutian Pribilof Island Community Development Association (APICDA) represents the five communities of Atka, False Pass, Nelson Lagoon, Nikolski and St. George. Their industry partner is Trident Seafoods, Inc. APICDA received 18% of the total CDQ pollock allocation in 1992 - 1995.

Goals

According to the Community Development Plan submitted by APICDA, the major goals of APICDA are as follows:

1. **Provide capital for construction and investment to facilitate community participation in Bering Sea/Aleutian Islands fisheries.** APICDA plans to acquire and conserve capital to avail itself of investment opportunities while at the same time be aware of the overcapitalization of the fishing industry. When making investments, APICDA must review a variety of factors to properly gauge the value of the opportunity.

2. **Provide and promote employment and educational opportunities for local residents in all aspects of the Bering Sea/Aleutian islands fisheries.** APICDA member communities are strategically located in the Aleutian Island/Bering Sea region. As the economic health of the industry deteriorates, and fishing seasons become shorter and shorter, the location of support services becomes more and more important to the industry. Local infrastructure such as harbors and docks are necessary to provide support services. APICDA will strive to provide infrastructure development to all member communities.

3. **To become a self-sustaining entity that will foster continued development, participation and stability for the regions communities and their residents.** In the APICDA communities, there is no more valuable right than access to the right to fish commercially. To the extent that local residents do not receive IFQs, and/or to the extent that the accompanying CDQ programs for halibut and sablefish are insufficient to meet the harvest needs of local residents, APICDA plans to participate in programs designed to assist local residents in acquiring IFQs.

CDQ Group Management/Administration

APICDA's board of directors employs the firm of Pacific Associates for the daily management of the organization. Pacific Associates offices are located in Juneau, Alaska. APICDA also employs community liaison officers to disseminate information throughout their communities. Management and policy decisions are made by the Board and carried out by Pacific Associates, their harvesting partner and subsidiary corporations.

Other CDQ Activities

Offshore Employment - Trident/Starbound offers a preferential hire program for residents of the APICDA area. They also provide training when needed and are investigating the establishment of a shoreside training program.

Training and Educational Program - APICDA's training program strives to provide meaningful employment and training opportunities by ensuring that all residents of APICDA communities fully understand the program. APICDA does this through employment of community liaison officers in each community.

Product Diversification Program - The product diversification program constitutes a major commitment to work with Trident and Starbound to develop new and expanded product forms from salmon.

APICDA Joint Ventures - Atka Pride Seafoods - APICDA formed a joint venture partnership with Atka Fishermen's Association to upgrade the existing processing facility and operate the processing plant as Atka Pride Seafoods.

APICDA Management Corporation - AMC holds all wholly owned subsidiaries of APICDA. - Atka Floating Dock - APICDA has constructed a small floating dock to serve the needs of the community until a larger, permanent dock can be constructed. AMC also owns three 32' longline vessels which are operated by local residents.

False Pass Dock Improvement - APICDA allocated funds to install sewer and water services to the dock.

St. George Dredge - APICDA provided $1.2 million to match the $3.3 million of state funds to dredge the St. George Harbor. APICDA views this as an economic investment since APICDA will participate in subsequent economic activity.

St. George Dock - APICDA has allocated almost a million dollars during 1995 for the design and construction of a dock in St. George. This facility will be owned by

APICDA Management Corporation and will be located on land APICDA leased from the City of St. George as a quid pro quo exchange for APICDA's earlier contribution toward the completion of the Zapadni Bay dredging project.

Loan Guarantee Program - APICDA has plans to provide an IFQ loan guarantee program to assist local residents in purchasing halibut and sablefish quota shares.

Nelson Lagoon Dock - The Nelson Lagoon Dock project continues on schedule, construction is expected to begin in the spring of 1995.

BRISTOL BAY ECONOMIC DEVELOPMENT CORPORATION

Bristol Bay Economic Development Corporation (BBEDC) represents the thirteen communities of Aleknagik, Clark's Point, Dillingham, Egegik, Ekuk, Manokotak, Naknek, King Salmon, South Naknek, Togiak, Twin Hills, Pilot Point, Ugashik and Port Heiden. Their industry partner is Oceantrawl, Inc. BBEDC received 20% of the total CDQ pollock allocation in 1992-1995.

According to the Community Development Plan submitted by BBEDC, the major goals of BBEDC are as follows:

Long range goals:

1. Increase and improve the quality of employment opportunities.

2. Develop long term employment opportunities and job diversification by funding vocational and academic scholarships.

3. Strengthen and expand the region's fisheries industry.

Specific Goals

A1 Provide a self-sustaining basis for community development and employment.

A2 Employment for the region's residents.

A3 Provide training and education to residents appropriate to developing new employment opportunities.

A4 Develop a regional fishery's development plan that anticipates changes in North Pacific fisheries.

A5 Provide for infrastructure development based on new economic development.

A6 Develop a timely method for getting information about the corporation and its programs out to the region and interested public.

A7 Develop and maintain an efficient and cost effective staff and internal administrative and management procedures.

A8 Maintain an effective and efficient Board of Directors.

CDQ Group Management/Administration

The Bristol Bay Economic Development Corporation offices are located in Dillingham, Alaska. Employment at BBEDC consists of an executive director, an office manager and secretary. Various consultant services are contracted as needed.

Other CDQ Activities

Offshore Employment Program - BBEDC works closely with their industry partner, Oceantrawl, to place their people on factory trawlers as entry level workers and encourages upward mobility.

Permit Stabilization Program - BBEDC has developed a permit brokerage business as an independent broker with Permit Masters. Permit Masters, Ltd. in Seattle is an established and reputable broker of fishing permits. The objective is to retain limited entry permits within the community when an individual is forced to sell his/her permit for various reasons.

Training and Scholarship Program - The training program has altered from the original 1993 CDP. Factory trawler training at a vocational school has decreased due to the fact that Oceantrawl prefers to do their own training. BBEDC is concentrating on basic vocational training to develop human resources in a broad and diverse context. BBEDC is also working with industry and government to develop an observer training program for the region.

Alaska Seafood Investment Fund - BBEDC has established the Alaska Seafood Investment Fund (ASIF) to make investments in Alaskan seafood businesses. These investments will be made outside of Bristol Bay's fully developed sockeye salmon and herring fisheries.

CENTRAL BERING SEA FISHERMEN'S ASSOCIATION

Central Bering Sea Fishermen's Association (CBSFA) represents the community of St. Paul. CBSFA was allocated 10% of the total pollock CDQ allocation for the 1992/93 season and 8% for the 1994/95 season.

According to the goals of CBSFA's Community Development Plan, the major development goals are as follows:

1. Develop for St. Paul Island a stable, self-sufficient, enduring and diversified economy not based on the harvest of furs seals, as directed by the Fur Seal Act Amendment of 1983.

2. Develop an appropriate locally based, locally owned, Bering Sea fishing fleet, to contribute community economic benefits and stability, key participation in local fishery business infrastructure, and safe and efficient harvest of local commercially valuable species.

3. Establish and maintain local access to Bering Sea resources as a key component in establishment and maintenance of an economy for St. Paul Island.

4. Establish Aleut participation and CBSFA participation in management and preservation of a Bering Sea ecosystem that supports rational use of renewable Bering Sea resources for the benefit of all persons.

5. Convert and merge a successful community fishery development plan and CDQ quota with the NPFMC fishery rationalization plan.

CDQ Group Management/Administration

Central Bering Sea Fishermen's Association is managed by the President of the board of directors who acts as the executive director of CBSFA. CBSFA's main office is located in Anchorage, with another office in St. Paul. CBSFA staff is mainly comprised of St. Paul residents, with consultants contracted on a part-time basis.

Other CDQ Activities

St. Paul Harbor Dredge - CBSFA along with the State of Alaska has committed funds for the dredge of the St. Paul Harbor. This project has an expected completion date of Spring 1995.

Temporary Marine Facilities - A small dock will be constructed upon completion of the harbor dredge. The dock has been designed and materials purchased, however construction is on hold pending completion of the dredge.

Scholarship Program - CBSFA has dedicated funds to a scholarship fund for St. Paul Island students accepted to institutions of higher education.

Vocational Training - CBSFA makes funds available for St. Paul Island Aleuts to obtain vocational or technical training in any field related to development of a fishery economy on St. Paul Island.

Fishery Employment - CBSFA will provide meaningful employment for the Aleut population of St. Paul Island. Jobs will be generated in commercial fishing operations, seafood processing, resource management and other fishery management and service related employment opportunities.

Vessel Loan Program - CBSFA loans up to 1/3 of the value of a vessel at reduced interest rates for locally qualified applicants who are successful in obtaining traditional financing for the remaining 2/3.

Gear Loan Program - CBSFA provides 100% financing for local fishermen at reduced interest rates to finance fishing gear for locally owned fishing vessels.

Test Fishery Project - CBSFA chartered a Bering Sea fishing vessel to test fish waters around St. Paul Island using a variety of small vessel pot gear to determine future fishery development.

Equity Investment in Longline Vessel - CBSFA has purchased ownership interest in the F/V Zolotoi.

Impact Fund - CBSFA has established an impact fund available for social, recreational and cultural impacts.

COASTAL VILLAGES FISHING COOPERATIVE

The Coastal Villages Fishing Cooperative (CVFC) represents the communities of Cherfornak, Chevak, Eek, Goodnews Bay, Hooper Bay, Kipnuk, Konigianak, Kwigillingok, Mekoryuk, Newtok, Nightmute, Platinum, Quinhagak, Scammon Bay, Tooksok Bay, Tuntutuliak, and Tununak. CVFC received 27% of the total pollock CDQ allocation during 1992 - 1995.

The Community Development Plan submitted by CVFC identifies the following major development goals:

1. Through the CDQ program, to develop a self-sustaining, self-sufficient fisheries economy in the CVFC region.

2. Develop the technical and managerial potential of CVFC members to own and operate a diversified fishing company through a "career track" program.

3. Provide jobs and expand employment opportunities for the residents of CVFC member villages.

4. Accumulate capital for Coastal Village region fisheries infrastructure development through:
    - Profit distributions from CVFC/Golden Age Fisheries(GAF) owned vessels
    - Employment on CVFC/GAF owned vessels in the CDQ fisheries or others
    - Employment on all other GAF owned vessels in all fisheries
    - Identification and development of new local fisheries resulting from nearshore trawl survey
    - Increase employment in local fisheries
    - Increased ownership of local fisheries
    - Expanded markets for local fisheries
    - Higher prices for products from the local fisheries through competition improved quality control and product development
    - Higher prices for products through sales and marketing which emphasize the superior quality of CVFC region products

5. Invest capital in new ventures to further develop the Coastal Villages region.

6. Establish CVFC ownership in onshore processing facilities (for value-added production) and off-shore harvesting and processing capacity (factory trawlers, longliner, crab and processing vessels) capable of fishing in nearshore and offshore fisheries.

7. Provide markets for local salmon and herring fisheries.

CDQ Group Management/Administration

The Coastal Villages Fishing Cooperative, organized as a ***for-profit*** cooperative corporation, made a conscious decision to remain relatively small and lean during it early development. The cooperative employs four individuals: one each located at offices in Chevak, Bethel, Tooksok Bay and the executive director in Juneau.

Other CDQ Activities

Resident Employment Program - CVFC has an employment coordinator who actively recruits CVFC residents for employment and internship opportunities especially with Golden Alaska Fisheries ventures.

Scholarship Fund - CVFC and GAF created the Coastal Villages Scholarship Fund through the contribution by CVFC and GAF joint ventures of 5% of their profits. The fund has been incorporated as a non-profit corporation under the State of Alaska and awards scholarship grants or loans.

Coastal Village Fisheries - CVF is the first major locally owned salmon operation on the Kuskokwim river. This venture became operational in 1993. Due to poor salmon returns, CVF did not operate in 1994.

Imarpiqamiut Partnership - A fundamental part of CVFC's CDP is the 50% ownership in the F/T Brown's Point with its partner, Golden Age Fisheries. This vessel provides CVFC with direct access to the Bering Sea groundfish resources as well as a platform for processing value-added salmon products. This also allows for training of CVFC residents aboard their own vessel.

NORTON SOUND ECONOMIC DEVELOPMENT CORPORATION

The Norton Sound Economic Development Corporation (NSEDC) represents the villages of Brevig Mission, Diomede/Inalik, Elim, Gambell, Golovin, Koyuk, Nome, Savoonga, Shaktoolik, St. Michael, Stebbins, Teller, Unalakleet, Wales and White Mountain. NSEDC was allocated 20% of the total CDQ pollock allocation in 1992 - 1995.

According to the Community Development Plan submitted by NSEDC, the major goals of NSEDC are as follows:

1. Employment continues to be the top priority for the 94/95 program for the Bering Strait region. Increased employment and the resulting income are the prime objectives behind each of the programs described in the CDP. Whether the employment is jobs in shoreside fish plants, on floating processors, on fishing boats in existing or new fisheries, in office work etc., NSEDC is committed to this program.

2. Self-Sustaining Fisheries Development.
Another priority is that NSEDC's activities and programs be able to stand alone. NSEDC was established as a permanent regional economic development force for the future.

3. Education and Training
One of the biggest components of the NSEDC CDP continues to be education and training. These goals are addressed through NSEDC's training, education and employment program, and the endowment fund.

4. Retention/Addition of Locally Held Permits
The ability to participate in many nearshore fisheries has traditionally depended on who owns the limited-entry permits. One of the disadvantages of the transferable permits is that the ownership of the right to fish in regional waters may be sold or awarded to a party outside of the community, meaning that some of the economic value of the fishery is not captured locally. NSEDC will provide local fishermen with loan funds to purchase limited entry permits and IFQ's.

5. Fisheries Rehabilitation and Enhancement
NSEDC intends to increase economic returns by rehabilitating or enhancing salmon runs in the Bering Strait region.

6. Provision of Value to State and Local Government
NSEDC believes that as in shore-based fisheries, CDQ operations should help pay for state costs related to establishing and implementing the CDQ program. The passage of a state landing tax by the Alaska legislature in 1993 accomplished this goal.

CDQ Management/Administration

The Norton Sound Economic Development Corporation is organized as a tax-exempt not-for-profit corporation. NSEDC manages their CDQ program with an executive director, located in their Elim headquarters, and local staff personnel in various locations. NSEDC has five advisory committees which hold periodic meetings to review CDQ program activities. Consultants are contracted as needed.

Other CDQ Activities

Resident Employment Program - NSEDC has set near-term goals for hiring local people to work in the Bering Sea fishing industry in jobs that will directly result from CDQ fishing operations. GFC hires residents of the Bering Strait region on a preferential basis for CDQ operations and any other fisheries related to GFC and NSEDC.

Education Endowment Fund - NSEDC provides scholarships to qualified students in the region to obtain advanced or continuing, technical and vocational, and/or a college education. GAF contributes to the scholarship fund to assist residents attending college to obtain an education in a fisheries related field.

Revolving Loan Program - NSEDC has established a revolving loan program to provide capital at reasonable interest rates to fishermen throughout the region to help support commercial fishing activities. This includes: 1) vessel upgrade loans, 2) herring and salmon gear loans, 3) crab and halibut gear loans, and 4) permit loans.

Norton Sound Crab Company - The Norton Sound Crab Company operates as a crab, salmon and bait processing facility in Nome. Recently, a smoker was installed to process a value-added product as part of their long-term diversification strategy.

Norton Sound Fish Company - NSEDC made an equity investment in a joint venture with Glacier Fish Company (GFC) to acquire and operate a freezer/longliner vessel. The F/V Norton Sound became fully operational in 1995.

Unalakleet Processing Plant - The Village Council of Unalakleet received a grant to revitalize the fish processing plant in Unalakleet.

Salmon and Herring Marketing Program - NSEDC has organized salmon and herring buying/processing operations and will conduct additional market research for various products from the Norton Sound fisheries.

Koyuk Ice Delivery System - In 1993, NSEDC allocated funds to purchase and ship an ice machine to Koyuk as part of a project to develop an ice delivery system to support Norton Bay salmon fisheries.

Savoonga Ice Delivery System - The City of Savoonga received funds from NSEDC to build an ice delivery system to support the developing commercial halibut fishery.

Shaktoolik Processing Plant - The City of Shaktoolik was allocated funds to make repairs to their fish plant to support the salmon fishery.

Salmon Rehabilitation and Enhancement Program - The salmon restoration and enhancement program includes three components: 1) comprehensive planning with substantial local involvement, 2) resource inventory and 3) a development fund to finance future site-specific projects.

St. Lawrence Island Halibut Fishery - In 1993, NSEDC established a commercial halibut fishery at St. Lawrence Island. This work included successful efforts to change International Pacific Halibut Commission (IPHC) regulations to establish an experimental fishery in area 4D.

YUKON DELTA FISHERIES DEVELOPMENT ASSOCIATION

Yukon Delta Fisheries Development Association (YDFDA) represents the communities of Alakanuk, Emmonak, Kotlik and Sheldon Point. YDFDA received 5% of the CDQ pollock allocation in 1992-1993 and 7% of the total pollock CDQ allocation in 1994-1995.

According to the Community Development Plan submitted by YDFDA, the major development goals are as follows:

1. Stabilize, enhance, and diversify the economy of the Lower Yukon River Delta region by participating in the Bering Sea goundfish industry.

2. Maximize the social and economic benefits to the lower Yukon River Delta region from the harvesting and processing of Bering Sea fisheries.

3. Safeguard the benefits achieved in Objective 1 and 2 through responsible participation in a range of Bering Sea resource management institutions.

CDQ Management/Administration

The Yukon Delta Fishermen's Association is organized as a not-for-profit corporation created expressly to develop the economy of the Yukon Delta region. YDFDA currently has their main office in Seattle, with Golden Alaska Seafoods, and employs an executive director, office manager and accountant. YDFDA also maintains an office in Seward to be near the Alaska Vocational and Technical Education Center, which is conducting much of their industry and boat building training.

Other CDQ Activities

Fishery Employment Program - The employment objectives of the employment program are to provide on-the-job training and experience in offshore fisheries to community residents and provide immediate employment and income-earning opportunities to these residents.

Comprehensive Training Program - YDFDA will strive to assure that 1) an appropriately skilled native workforce is available for all opportunities created in the CDQ enterprises and 2) provide technical knowledge to the native workforce to assure that qualifications are developed to enable them to move into high paying senior positions.

Exploratory Fishing Research - The exploratory fishing research program conducts research on the distribution, appropriate gear, and preferred fishing methods suitable for community-based commercial fishing in the eastern Bering Sea.

Yukon Delta Fish Marketing Cooperative - YDFDA loaned funds to the Yukon Delta Fish Marketing Cooperative to provide matching funds for a federal Economic Development Assistance grant of $680,000. The money will be used to upgrade and expand existing processing facilities Emmonak.

Yukon Delta Fisheries, Inc. - The major component to YDFDA's CDP is the establishment of a small-multi fishery boat fleet. YDFDA currently has six, thirty-two foot aluminum boats and two larger vessels fishing several species, and two more 32' boats are being built at AVTEC in Seward.

V. ECONOMIC IMPACTS OF THE CDQ PROGRAM

This chapter examines the economic impacts of the CDQ program, narrowly defined as changes in employment and income attributable to the CDQ program. The following chapter will look at the broader and more difficult question of the contribution of the CDQ program to "economic development."

Direct Employment and Income Impacts of the CDQ Program

Table V-1 summarizes the "Number Working," "Total Wages" and "Work Hours" information reported for all CDQ group reported in the quarterly reports. The table shows the information reported for each quarter as well as annual average "Number Working" (the total for the four quarters divided by four) and total annual wages. In the discussion below, we use the term "jobs" in place of "number working." The annual average number working on CDQ group projects was 173 in 1993 and 387 in 1994. The highest quarterly number working was 213 in the third quarter of 1993 and 761 in the third quarter of 1994.

Total wages for all CDQ jobs were $2.5 million in 1993 and $4.2 million in 1994. Total wages divided by the number working (a rough measure of average annual income per CDQ job) was $14.5 thousand in 1993 and $13.4 thousand in 1994.

As shown in Figure V-1, in 1994 CDQ management and administration accounted for 10 percent of 1994 jobs and 19 percent of wages. Pollock harvesting and processing accounted for 18 percent of jobs and 26 percent of wages. Salmon, herring and halibut fisheries accounted for 32 percent of jobs and 19 percent of wages. Other employment accounted for 40 percent of jobs and 36 percent of wages.

Table V-1: CDQ Employment and Wages: All CDQ Groups

	Quarter								Annual Average/Total*	
Employment by Quarter	93-1	93-2	93-3	93-4	94-1	94-2	94-3	94-4	1993	1994
Number Working										
Management/Administrative	21	23	23	28	36	41	41	43	24	40
CDQ Pollock-Related	120	44	50	67	117	53	90	24	70	71
Salmon, Herring & Halibut-Related	0	110	122	0	0	217	276	0	58	123
Other Employment	13	21	18	31	63	133	354	58	21	152
Total	154	198	213	126	216	444	761	125	173	387
Total Wages inc. Benefits ($)										
Management/Administrative	105,730	139,670	142,871	205,235	220,500	285,516	259,052	240,748	593,506	1,005,816
CDQ Pollock-Related	647,057	132,190	245,933	316,140	682,576	168,754	351,269	152,549	1,341,320	1,355,148
Salmon, Herring & Halibut-Related	0	26,447	15,477	0	0	210,898	789,205	0	41,924	1,000,103
Other Employment	150,648	51,779	60,709	267,604	243,062	277,883	769,369	521,085	530,740	1,811,399
Total	903,435	350,086	464,990	788,979	1,146,138	943,051	2,168,895	914,382	2,507,490	5,172,466
Total Wages/Number Working										
Management/Administrative	5035	6073	6212	7330	6125	6964	6318	5599	24,990	24,989
CDQ Pollock-Related	5392	3004	4919	4719	5834	3184	3903	6356	19,094	19,087
Salmon, Herring & Halibut-Related		240	127			972	2859		723	8,114
Other Employment	11588	2466	3373	8632	3858	2089	2173	8984	25,578	11,917
Total	5866	1768	2183	6262	5306	2124	2850	7315	14,515	13,383

*Annual average number working; total annual wages. Blanks indicate that data were not available. Source: CDQ Group Quarterly Reports.

Relative Employment and Income Impacts of the CDQ Program

An overview of the relative impacts of the CDQ program may be gained by comparing employment and income generated by the CDQ program with employment and income reported by the 1990 U.S. Census on data from 1989. Note that the census measures employment at the time the census was taken (April 1990) rather than annual average employment. Thus the census employment data are not necessarily representative of annual average employment in 1989. However, the census does provide a measure of total annual income in 1989.

Relative Employment Impacts

The top two rows of Table V-2 show two different measures of employment in April 1989: total employment and "basic employment." "Basic" employment refers to employment in the following private sector basic industries:

Table V-2: CDQ Employment & Income Compared with 1989 Employment & Income Reported by 1990 U.S. Census	Total, All CDQ Groups
Employment in 1989 (from census)	6281
"Basic" employment in 1989	679
CDQ employment	
1993 average	173
1994 average	387
1993 highest quarter	213
1994 highest quarter	761
CDQ employment as % of 1989 emp.	
1993 average	3%
1994 average	6%
1993 highest quarter	3%
1994 highest quarter	12%
CDQ employment as % of "basic" emp.	
1993 average	25%
1994 average	57%
1993 highest quarter	31%
1994 highest quarter	112%
Total income in 1989 (from census)	$219,708,878
CDQ wages	
1993 total	$2,507,490
1994 total	$5,172,466
CDQ wages as % of 1989	
1993 wages as % of 1989	1.1%
1994 wages as % of 1989	2.4%

Agriculture, forestry and fisheries
Mining
Construction
Manufacturing, nondurable goods
Manufacturing, durable goods

Basic industries usually produce goods or services for sale outside a region, and usually represent the foundation of a region's economy. Other industries, such as transportation, communications, trade, and services are usually considered "support" industries, in that they provide goods or services for sale within a region and are driven by income produced in the basic industries. In rural Alaska, government often provides much of the foundation that basic industries might provide in other, more developed regions.

As can be seen in Table V-2, basic employment tends to be much lower than total employment in most CDQ regions--although the census may have understated basic employment because fishing and mining activities are concentrated during the summer months.

The middle rows of Table V-2 compare these census employment data with four measures of CDQ employment:

1993 average number employed
1994 average number employed
1993 highest quarter for number employed
1994 highest quarter for number employed

Average 1993 CDQ jobs were 3% of 1989 employment, and average 1994 CDQ jobs were 6% of 1989 employment. CDQ jobs in the highest quarter (the third quarter) of 1993 were 6% of 1989 employment, and CDQ jobs in the highest quarter (the third quarter) of 1994 were 12% of CDQ employment.

CDQ jobs were much higher as a percentage of 1989 "basic employment." For example, average CDQ jobs in 1994 were 57 percent of total "basic" employment in 1989. For some CDQ groups the CDQ program represented more than a doubling of total "basic" employment compared with that reported in the 1989 census. Put differently, although CDQ jobs appear to represent a relatively small share of *total* jobs in the CDQ region, they represent a very substantial increase in "basic" employment.

Relative Income Impacts

The bottom rows of Table V-2 compare CDQ wages with total annual income in 1989 for each of the CDQ group areas. For the CDQ region as a whole, 1993 CDQ wages and benefits represented a 1.1% increase in income compared with 1989, while 1994 CDQ wages and benefits represented a 2.4% increase in income.

Indirect Employment and Income Effects

Some of the income earned in CDQ jobs, as well as spending for supplies and services in support of CDQ projects, passes through local merchants, service providers, and others before the money "leaks" out of the region for imports. The additional employment and income generated in this way is referred to as "indirect" economic impacts. In an area such as western Alaska, where very few goods and services are provided locally, money leaks out of the region relatively quickly. For example, a 1987 report by the University of Alaska's Institute of Social and Economic Research estimated that each dollar of income generated in commercial fishing in southwest Alaska generates an additional 24 cents of income within the region.[1]

It is impossible to estimate precisely the indirect employment and income impacts of the CDQ region, but it is reasonable to assume that they are smaller than the direct impacts--probably about half the magnitude or less. Nevertheless, every extra contribution to jobs and income helps, and these additional impacts of the CDQ program should not be overlooked.

[1]Matthew Berman and Teresa Hull, *The Commercial Fishing Industry in Alaska's Economy,* Institute of Social and Economic Research, March 1987, page 44.

Data Sources

The CDQ employment and income data are derived from quarterly reports provided by the six CDQ groups to the Alaska Department of Community and Regional Affairs (DCRA). For each of the eight quarters in 1993 and 1994, each of the six groups has prepared a Quarterly Activity Report for DCRA. Among other information, the quarterly activity reports include summary employment tables providing information on four kinds of employment:

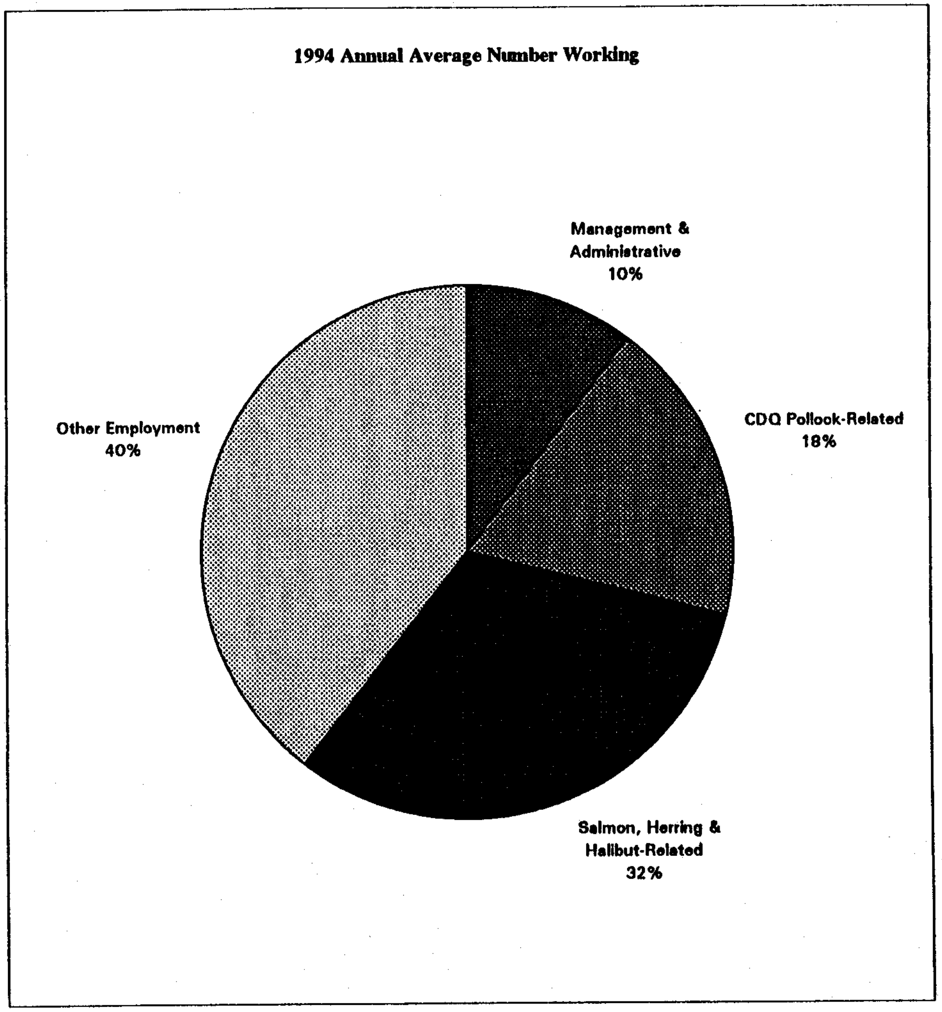
Management/Administration Employment
CDQ Pollock-Related Employment
Salmon, Herring, and Halibut Fishing/Processing Employment
Other Employment

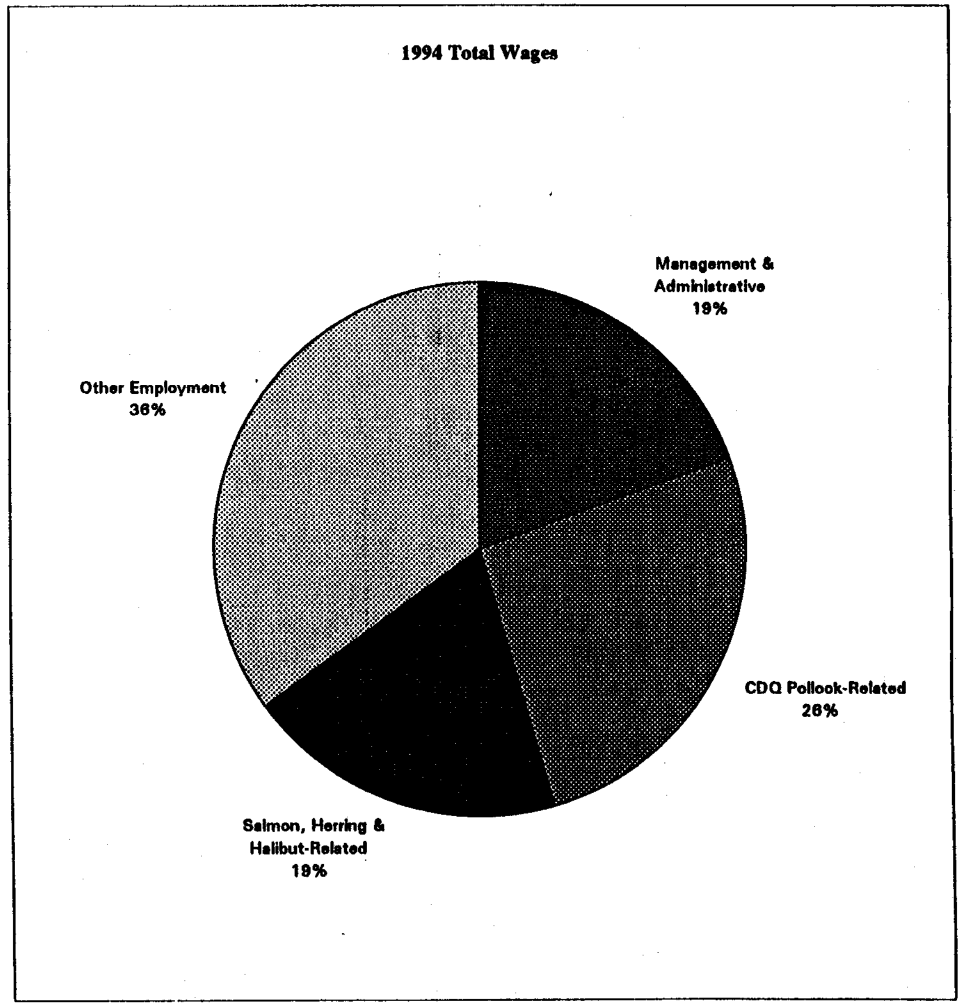
For each of these kinds of employment, the following information is provided:

Number of CDQ region residents working
Total wages and benefits earned by CDQ region residents
Total work days worked by CDQ region residents (not reported by some CDQ groups)

The data reported by the CDQ groups are not necessarily perfect for assessing the precise contribution of the CDQ program to employment and income in western Alaska. For example, some jobs are part-time or seasonal, or involve matching funds or joint ventures with non-CDQ organizations. However, the data represent the only detailed source of information on employment and income generated by the CDQ program. As long as the limitations described above are kept in mind, and it is recognized that actual employment and income impacts may be somewhat lower or higher than reported, it is reasonable to use these data to gain a general sense of the economic impacts of the CDQ program to date.

FIGURE V-1


1994 Annual Average Number Working
Management & Administrative 10%
CDQ Pollock-Related 18%
Salmon, Herring & Halibut-Related 32%
Other Employment 40%


1994 Total Wages
Management & Administrative 19%
CDQ Pollock-Related 26%
Salmon, Herring & Halibut-Related 19%
Other Employment 36%

VI. OTHER IMPACTS OF THE COMMUNITY DEVELOPMENT PROGRAM

Infrastructure Development

A major goal of many of the CDQ groups was to develop infrastructure within the region that would make possible greater participation in the fishing industry. Substantial progress has been made towards this goal. Major infrastructure projects which have been completed or are underway include:

1) Dock facilities in Atka, Nelson Lagoon, False Pass and Nome;
2) Harbor improvements in St. George and St. Paul;
3) Ice Delivery Systems in Savoonga and Koyuk;
4) Gear Storage facilities in False Pass.

Each of these infrastructure developments provide benefits to the region as a whole as well as the entire fishing industry. However, the exact economic impacts are difficult to measure at this time. Additional infrastructure is needed in many communities and there are several projects in the development stage:

1) Dock and small boat harbor in St. Paul
2) Boat ramp in Nikolski
3) Large dock facility in Atka
4) Additional buying stations in Golovin and Moses Pt.

Without additional CDQ funds from the continuation of the pollock CDQ program, the future of these projects is uncertain. The level of infrastructure development in Western Alaska is minimal, thus one of the reasons for the CDQ program. It is unreasonable to expect two years worth of activity sufficient to bring an area as large and diverse as the western coastal region up to current development standards. The gains to date represent 61% of the projects identified in the Community Development Plans as necessary to achieve the identified goals. This is remarkable given the short time frame involved.

Several other projects have been identified as necessary infrastructure for the development of even a limited fishing economy. However with the future of the pollock CDQ program unpredictable, it is difficult to draft a development strategy. A complete list of proposed infrastructure development projects was presented in chapter four.

Apart from the physical infrastructure needs of the community, equally important is the business infrastructure such as developed markets and management expertise necessary for the successful operation of a business. The Community Development Quota program has invested heavily in this type of infrastructure development through the technology transfers which exists between the CDQ groups and their industry partners.

The CDQ organizations work closely with their pollock partners in several aspects of the fishing industry. Several organizations have interns within their offices as well as providing expertise to the CDQ organizations staff and board members when needed. It is through this process that the knowledge necessary for the successful participation within the Bering Sea fishery is gained.

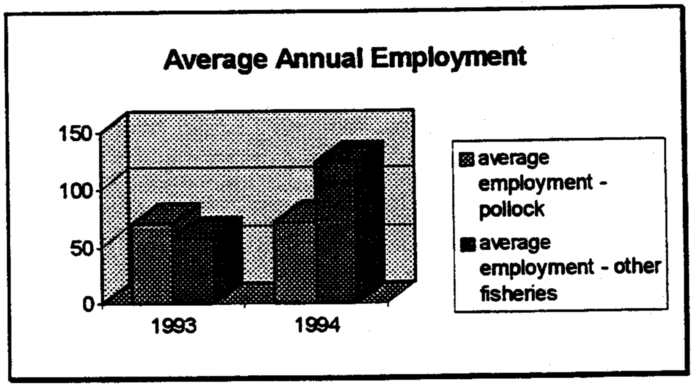
Another major contribution of the CDQ program has been the investment of resources and the assumption of risk in the development of new salmon products. Three CDQ groups and their harvesting partners have spearheaded industry efforts to produce boneless, skinless frozen salmon product forms at a time when the Alaska salmon industry needs to expand their product lines.

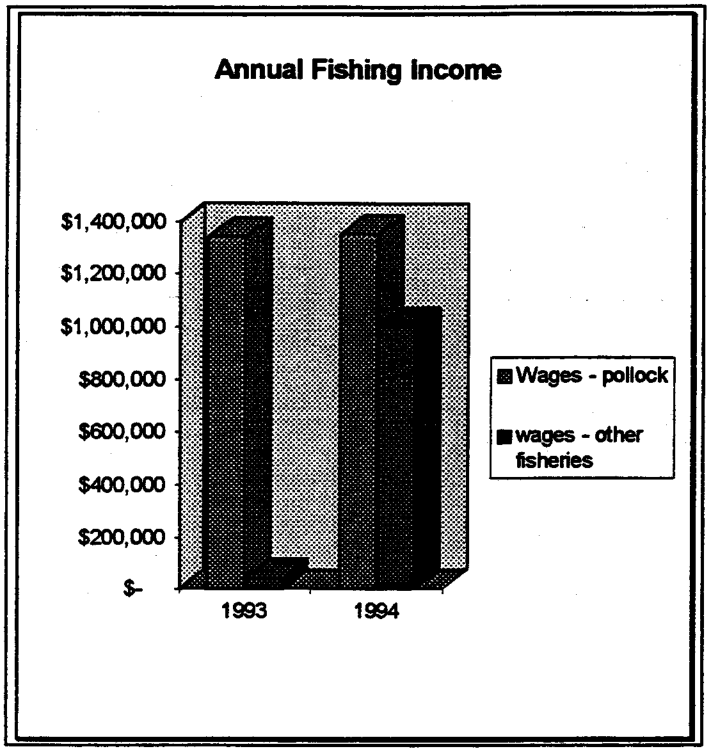
Fisheries Participation

Another major goal of the CDQ program was to provide for increased participation by western Alaska residents in the fisheries of the Bering Sea, including both the pollock fishery as well as other fisheries. Progress has been made towards this goal, but much remains to be achieved.

As discussed in chapter five, employment within the fisheries has increased dramatically for residents of western Alaska, not only on factory trawlers but on smaller vessels, and shoreside processing plants as well. Many CDQ groups have purchased interest in longliners, a factory trawler, or have begun to develop a small multi-fishery fleet. The establishment of loan programs has also facilitated increased involvement in the fisheries of the Bering Sea. Several fishermen are now able to purchase small vessels and/or gear where previously, conventional financing was not available.

The following graphs shows the level of employment and wages in the pollock and other Bering Sea fisheries:





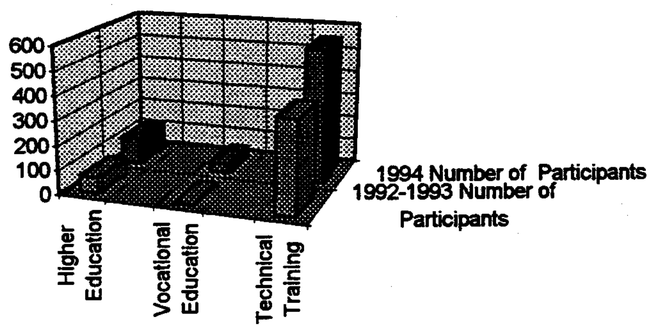
An important issue is whether future fisheries participation by western Alaska residents is dependent on continuation of the CDQ program. The State believes that most of the gains which have been made to date might be lost if the CDQ program were to end in 1995. For example, investments made by CDQ groups in fishing vessels and processing plants might not be viable if guaranteed access to pollock resources were not continued. Also, many of the projects which are in the development stage may not be completed if CDQ revenues cease.

With the exception of one, all of the CDQ groups now have access to the resources of the Bering Sea through their investments in a variety of fishing vessels. Although the investments are often limited to a minority position in a single vessel, the fact remains that the CDQ organizations are gaining entry. The amount of capital required to gain entry is enormous, and these efforts are the beginning of a localized fleet.

However, other gains are clearly permanent. For example, the small multi-fishery fleet built by the Yukon Delta Fishermen's Association participates in the halibut and sablefish, other bottom fish and crab fisheries. Their fleet operates from Norton Sound to Unalaska. The residents of the YDFDA region are quickly gaining skills that will prove useful for years to come.

Training and Education

Training and education of residents is an important goal for all of the CDQ groups and the training opportunities for the residents in the region are substantial. The chart below is indicative of the increased training opportunities to the residents of western Alaska. A total of 176 scholarship participants, 927 technical participants and 38 vocational students have benefited from the variety of educational opportunities available during the period late 1992 through Dec. 1994.



The importance of appropriate educational training at all levels cannot be overlooked. For any society to build sustainable development and improve the standard of living of their community, an educated populace is necessary. The CDQ groups provide training for their residents based not only on the needs of the individual, but the needs of the community overall.

The following table describes some the type of training and number of participant for the CDQ groups as a whole:

Table VI-1

	1992-1993 Participants	1994 Participants	Totals
Higher Education	64	112	176
Includes University and College			
Vocational Education			
Aluninum Boat Fabrication	0	18	18
Auto and Diesel Technology	0	4	4
Biomedics Electronic Technician	0	1	1
Business Management	0	8	8
Carpenter	0	1	1
Paralegal	0	2	2
Power Plant Operation	0	1	1
Seafood Industry Management	0	2	2
Travel Specialist	0	1	1
	0	38	38
Technical Training			
Processing Workers	161	44	205
Vessel Safety	49	92	141
Fishing Training	47	90	137
Computer Applications	30	151	181
Electronic Navigation	26	65	91
Equipment Operation	23	28	51
Mechanics/Welding	14	51	65
Grants Management	12	12	24
Clerical	6	15	21
EMS	5	0	5
HAZWOP	1	0	1
Baker	1	0	1
Marine Firefighting	0	1	1
Industrial Refrigeration	0	1	1
HVAC	0	2	2
	375	552	927

This table represents 1141 training opportunities for the residents of western Alaska during a twenty four month period. These training and educational opportunities will enhance the ability of the residents to gain employment in all aspects of the fishing industry. When these numbers are compared with the figures in table II-2, which shows a total number of people unemployed in all CDQ regions of 1217, the impact of the CDQ group's training programs is enormous.

CDQ Financial Reporting

The CDQ groups are required to provide financial information on a quarterly basis and annual audited financial statements to the State of Alaska. The specific financial data for each group is confidential. Therefore, a report on the financial status of each CDQ group is not possible. However, overall the CDQ groups are taking a conservative approach in their investment decisions.

Several CDQ groups have advisory board members from the financial community who are non-voting board members. Due to the complexity of the fishing industry, these members are able to give insight from a financial perspective that may not otherwise be available.

The CDQ groups have received approximately $53 million in royalties during the 1992-1994 period. The groups used these royalties to fund several infrastructure and product development projects, training and education programs, assist residents in gaining employment aboard factory trawlers as well as made investments in the fishing industry that will provide continued access to the Bering Sea.

Development Impacts

One of the goals of the Community Development Quota Program is to encourage "economic development" in the participating communities. An assessment of the program's success must have some way of recognizing the economic development consequences of the program. In this section we discuss what is generally accepted as the definition of economic development and suggest some ways to indicate the effect of the CDQ program on the economic development of the region.

Defining and measuring economic development is not easy. There are many potential dimensions to economic development. Development typically occurs over a period of time measured in decades rather than years, accompanied by other social, cultural and political changes. We should not expect to be able to measure progress towards "economic development" definitively after only two years. Much of the development has only been initiated through this initial infusion of capital. The CDQ program will require continued sustenance to survive its infancy.

Defining Economic Development

Definitions of economic development have evolved over time. The evolution of these definitions reflects the postwar development experience. Historically, economic development was perceived as synonymous with economic growth, and was measured in terms of the expansion of a region's output. In recent decades, however, economic development has increasingly been perceived as a process of complex structural changes in the economy and the society (Todaro, 1981).

According to currently accepted concepts of economic development, three characteristics help to define economic development in a region. First, when development occurs growth or at least expanded output becomes the norm. Put differently, short-term, one-time expansion of regional output is *not* economic development. In rural Alaska, the physical or economic exhaustion of a resource may end an economic boom, and leave a region no better off than it was prior to the boom. In contrast, economic development structure changes ensure higher levels of output which, once achieved, may be maintained or expanded.

A second characteristic of economic development is that the growth of output is shared. Regional economic development implies that the residents of the region share broadly in the gains in income created by economic growth. Regional economic development includes development of the people of the region as well as the surrounding and supporting infrastructure.

A final characteristic which is sometimes added to the definition of economic development is local control. This usually means that economic development also increases the importance of locally made economic decisions. Local residents can participate in economic growth as resource owners and entrepreneurs as well as employees.

Measuring Development Impacts of the CDQ Program

Because economic development is a complex process, it is difficult to measure. Attempting to assess the development consequences of the CDQ program is especially difficult because it has been in existence for only two years. Three questions can be asked which may serve as indicators of progress towards and potential for economic development resulting from the CDQ program.

Economic Growth *How many jobs and how much income has the CDQ program created? How do these jobs compare with the kinds of jobs which existed previously in the region?* By the simple measures of contribution to jobs and income, the CDQ program appears to be contributing to economic development. Clearly, the contribution varies between different CDQ groups. Clearly, the economic activity generated to date has not transformed the region economically--but there is no reason to expect that it would have. But it has generated many new "basic" jobs and new income in a region where there is very little economic base other than government.

Local control: *Are local residents in control of the new economic activities which are being created in the region? Has the program has worked to expand local decision making?. Are there more local entrepreneurs? Are more resources locally owned?* The CDQ program provides for direct local control of a portion of the Bering Sea pollock resource--although this control is exercised in cooperation with industry partners. The additional activities being carried out using the revenues generated from the pollock resource are clearly under local control and the skills to sustain long-term economic development remain a high priority of the CDQ program.

Sustainability: *Are the benefits generated by the CDQ program sustainable? Would they continue even if the CDQ program were to end? Have the CDQ group done things which will most likely result in continue growth or at least the maintenance of higher levels of income?* Obviously some of the activities generated by the CDQ program to date would come to an end if the CDQ program were to end. However, the program has also brought about significant investment in the region's physical and human capital--investments which would continue to contribute to future growth even if the program were to end. Infrastructure projects contribute to the viability of new economic activities. Training and education programs are providing residents with skills which can be used within the region or in other places. The program is also helping to develop business and entrepreneurial skills within the region.

In sum, by all of these measures, the CDQ program is contributing towards the process of economic development within the western Alaska region. It is bringing about economic development, as measured by jobs, local control, and long-term sustainability. Another aspect that should be considered is that it provides opportunities to work where few existed before, especially during the long winters when jobs are scarce. Not everyone chooses to fish, however the hope and opportunities created are an invaluable addition to the collective self-esteem of the region's people. However, there should be no expectation that the program could or should transform the region within a few years.